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TRANSACTIONS & STUDIES

of the

College of Physicians

of

Philadelphia

FOURTH SERIES

VOLUME 18

1950-51

WAVERLY PRESS, INC.
Baltimore, Md.

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An index to the annual volume of the *Transactions & Studies* appears in the fourth and final number (February) of the volume.

The scientific and historical communications are indexed in: *Biological Abstracts; Current List of Medical Literature; Quarterly Cumulative Index Medicus.*

The Transactions & Studies of the College of Physicians of Philadelphia is published four times a year—April, June, December, February—at Baltimore, Maryland by the College of Physicians of Philadelphia.
Subscription, $2 a volume. Single copies, 75 cents.
Publication Office: Mt. Royal and Guilford Aves., Baltimore 2, Md. *Editorial correspondence* should be addressed to: The Editor, College of Physicians of Philadelphia, 19 South 22d Street, Philadelphia-3, Pa.
Entered as second class matter June 21, 1938, at the Post Office at Baltimore, Md., under the act of August 24, 1912.
Printed in U. S. A.

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TRANSACTIONS & STUDIES

of the

College of Physicians of Philadelphia

Volume 18 (Fourth Series)

Number 1 (April 1950)

An Assessment of Etiologic Aspects of Peptic Ulcer and Surgical Therapy

Including Obscure, Massive Acid-Peptic Linked Hemorrhage, Esophagitis and Cardiospasm and Their Surgical Relief*

By OWEN H. WANGENSTEEN, M.D.

Department of Surgery, University of Minnesota, Minneapolis, Minnesota

IT IS indeed an honor to have the opportunity to come here to deliver the 1949 Alvarenga Lecture of the College of Physicians of Philadelphia. And to have the pleasure of speaking to you in this great hall, from whose walls the expressive faces of many of America's most distinguished physicians and surgeons of an earlier day look down upon us in forebearant and pensive silence, is a rare privilege, which I shall not forget. Let us treasure the memories which you have preserved in this atmosphere.

To your City of Brotherly Love, I am beholden for two previous honors, illy deserved on my part; nevertheless I cherish those marks of approval with a feeling of pride which I cannot readily disguise. Moreover, it is a duteous pleasure to have the opportunity to say so publicly here to a medical audience. To your officers who afforded me the opportunity to come here to address you upon a favorite theme of mine, but concerning which I know, in fact, very little, I too am grateful.

NATURE OF THE ULCER DIATHESIS

The nature of the ulcer diathesis is not fully understood. There are two items which stand out prominently: 1. The importance of the acid-peptic digestive factor in the genesis of ulcer; 2. The circumstance that certain factors, without augmenting gastric secretion, increase the vulnerability of the mucosa to digestion by the acid-peptic digestive juice. These factors, I have come to speak of as abetting causes of ulcer. They have to do largely with circumstances which alter the circulatory homeostasis of any mucosa which may come in direct contact with the acid-peptic digestive juice. Largely, these items group themselves into Selye's category of factors described by him

* Alvarenza Prize Lecture IX (Award XLIV), The College of Physicians of Philadelphia, 9 November 1949.

These researches were supported by the following funds: a grant from the U. S. P. H. S. (RG-1028), the Augustus L. Searle, Berenice Moriarity and Robert A. Cooper Funds for Surgical Research and by a grant from the Graduate School, University of Minnesota.

as the adaptation syndrome or reactions of alarm. They are essentially adrenergic in origin.

In our hands, the implantation of histamine in beeswax has been a very useful tool in exploring the nature of the ulcer diathesis (9). For a long time, there has been available satisfying experimental evidence of the significance of the acid-peptic factor in the origins of ulcer (24). I need only indicate that Bickel (1909), Exalto (1911), Langenskjold (1914), and Mann and Williamson (1923) successively showed that exclusion of bile and pancreatic juice from entry into the duodenum of the dog, at the usual site, was an effective means of producing ulcer. Matthews and Dragstedt (1932) inserted a one-way valve between the stomach and duodenum to preclude backward regurgitation of bile and pancreatic juice and succeeded thereby quite constantly in producing ulcer at the gastric outlet. Orndorff, Bergh and Ivy (1935) failed to produce bona fide ulcers in dogs by injecting dogs subcutaneously with 2 milligrams of aqueous histamine ten times a day over a long period of time extending up to 66 days.

Development of the technique of suspending histamine in beeswax to secure prolonged histamine action by Code and Varco (1940) provided an important tool of research for probing the genesis of ulcer. The application of this tool to a study of various items hedging about the problem has occupied the attention of a number of men in my laboratory over a period of ten years. This method has served to lend renewed emphasis to the great importance of the acid-peptic factor in the genesis of ulcer; it has been helpful in elucidating the nature of abettment of the histamine-provoked ulcer; moreover, it has been very useful in ascertaining what the characteristics are of a satisfactory operation, which will afford protection against recurrent ulcer. This presentation will concern itself essentially with a brief review of these items and constitutes, in large part, the consecutive effort of several of my associates who have spent a year or more of intensive work upon the ulcer problem in the Experimental Laboratory of Surgery.

SPECIES DIFFERENCE WITH REFERENCE TO EASE OF EXPERIMENTAL ULCER PRODUCTION

Most of the animals commonly employed in laboratory experimentation are very susceptible to ulcer provocation by the daily intramuscular implantation of histamine in beeswax. Two animals have been notably refractory: the rabbit and the monkey. This very circumstance has been of great help in exploring abetting causes of ulcer. Whereas, in the beginning, my associates and I were inclined to believe that, only agencies which augmented gastric secretion were ulcerogenic, we have learned that, a number of agencies which fail to influence gastric secretion or may, in fact, depress gastric acidity, such factors may, nevertheless, abet the ulcer diathesis. The rabbit particularly, and the monkey too, through their resistance to ulcer provocation by histamine alone, have been helpful in rendering intelligible the knowledge gained in the production of ulcers by concurrently operating factors which in themselves fail to augment gastric secretion.

If the cabbage, carrots and lettuce which constitute the rabbits' diet are run through a press, the cellulose being discarded, thereby doing away with the large residue constantly remaining in the rabbit's stomach—the daily administration of histamine to such rabbits succeeds readily in provoking perforated ulcer. Similarly, the intravenous injection into the rabbit of a small amount (1.5 c.c.) of fat, derived from the human omentum, plugs a sufficient number of end mucosal vessels such that, the daily simultaneous intramuscular administration of 30 milligrams of histamine succeeds quite regularly in provoking perforated ulcer in the rabbit within a few days with no alteration of the diet. And similarly with vasoconstricting agents such as epinephrine and pitressin: erosions and/or ulcers with profuse gastric hemorrhage are produced at will when rabbits on a normal diet receive histamine simultaneously.

Acceleration of the production of the histamine-provoked ulcer in dogs has been employed too as a criterion of abettment of the ulcer diathesis. During the 10-year interval in which histamine-in-beeswax has been used as a tool to study ulcer production in our Surgical Research Laboratory, the frequency with which ulcer may be produced in dogs within 5 days following the intramuscular implantation of 30 milligrams of histamine, once daily, has been assessed many times. The usual incidence is in the area of 20 per cent. A large increase of this incidence of the regular production of severe forms of ulcer such as perforation—these occurrences speak forcibly for the suggestion that such simultaneously operating factors, which enhance the frequency, accelerate the appearance or aggravate the severity of the ulcer—such factors or circumstances are abettors of ulcer and are ulcerogenic in nature.

ABETTING CAUSES OF ULCER

Fractures and burns abet the ulcer diathesis. Moreover, their clinical counterpart, especially in the instance of burns (Curling's ulcer) is well known. Neither appears to augment gastric secretion in dogs with isolated gastric pouches. In fractures, the abetting agent undoubtedly is coincidental fat embolism. This circumstance appears to be well supported now by factual evidence. In burns, the work of Friesen (1949) has shown quite convincingly that the abetting agent is hemoconcentration.

That agencies which cause temporary anemia of the gastric mucosa may cause ulcer, when an active acid-peptic secretion plies over such mucosal surfaces, is understandable. Venous stasis brought about through the agency of portal hypertension or the administration of nitroglycerin may do the same (26).

Dogs were submitted to the physical exertion of being run on the treadmill for a few hours each day and developed perforated ulcers readily when given histamine simultaneously. This very experiment was done in the laboratory 10 years earlier but then, because such exertion failed to augment gastric secretion, it was reasoned that physical exertion failed to influence ulcer occurrence. The nature of the ulcer abettment by physical fatigue undoubtedly has to do with a reflex effect upon the gastric mucosa which influence is essentially circulatory in origin. We have been unable so far in the cat or the dog to elicit evidence to suggest that anxiety or worry provoked by periodic faradic shock have a similar effect.

The old dog even when strenuous efforts are made to feed him well appears to be more susceptible to ulcer provocation by histamine than do young or middle-aged dogs. Shock and hemorrhage augment considerably ease of ulcer production in the dog receiving histamine. Shock is more important than anemia. If a dog is bled to shock level (systolic pressure less than 70 mm Hg), and after an interval not exceeding 10 minutes the removed blood is citrated and reinfused, the ease of ulcer production with histamine is greatly augmented. In other words, even temporary anemia of the gastric mucosa through the agency of a low blood pressure abets the ulcer diathesis.

Cold is a severe abettor of the histamine-provoked ulcer in the dog, rabbit and monkey. The monkey, which is virtually refractory to ulcer production by histamine alone, if kept in a cold room at 55°F. constantly over a period of 5 days, while receiving histamine intramuscularly simultaneously will develop ulcer perforation. This is undoubtedly an adrenergic factor as is evidenced by leucocytosis.

Strangely enough, elevation of the environmental temperature does not appear to abet the ulcer diathesis in the same manner as does cold in the dog.

Allergy induced in dogs, by the intravenous injection of antigens followed by subsequent local injection into the gastric or duodenal wall of antibodies to these antigens obtained from the horse, results in the ready production of hemorrhagic erosions and/or ulcers (6). Anoxia is also a powerful abettor of the histamine-provoked ulcer in the dog.

These observations, covering a variety of conditions (16), suggests the multiplicity of

circumstances which may reflexly increase the vulnerability of a juxta gastric-lying mucosa to injury by the digestive action of an active acid-peptic juice. These occurrences suggest too how complex the ulcer diathesis may be.

The latitude of difference between a patient, who has and one who does not have ulcer, is probably not great. These susceptibilities are worthy of further study. It is known that man's stomach is very responsive to caffeine as contrasted with the dog. Exploration of the various influences in our environment, whether of food or conditions of living, cannot help but give useful information on the nature of the ulcer diathesis.

THE AUTONOMIC NERVOUS SYSTEM AND ULCER PRODUCTION

A. *Vagotomy:*

Long years ago, Pavlov showed that, bilateral division of the vagi abolished the cephalic phase of gastric secretion. There appears to be accumulating evidence to suggest too that, vagotomy depresses both the gastric and the intestinal phases of gastric secretion. Whereas, the response to stimulants of parietal cell secretion may be lessened somewhat following vagotomy, nevertheless, the response to histamine, alcohol, caffeine and food, in the main, still follows the normal pattern.

Bilateral vagotomy in the dog affords real protection against the histamine-provoked ulcer. Yet, if urecholine is given to augment emptying of the stomach; or if a simultaneous drainage operation, such as gastrojejunostomy or excision of the antrum is done—under both circumstances, the fairly consistent protective effect of vagotomy against the histamine-provoked ulcer in the dog is largely lost. In other words, it is the retention of food within the stomach rather than depression of gastric secretion by vagotomy which protects against the histamine-provoked ulcer. The counterpart of this occurrence in the rabbit has been alluded to above.

B. *Sympathectomy:*

The effect of sympathectomy upon susceptibility to ulcer has been studied in this laboratory. Lillehei (14) (1948) observed that hemorrhagic gastric erosions and/or ulcer could be produced quite regularly in dogs if all the prevertebral mesenteric ganglia were removed; that is, if the celiac, superior and inferior mesenteric ganglia were all removed, such dogs develop diarrhea and many exhibit a hemorrhagic enteritis and colitis as well. Popielski (1903) and Lium (1941) have both reported similar observations. The simultaneous administration of histamine to dogs in which the prevertebral mesenteric ganglia are removed is not necessary to the production of ulcer, enteritis or colitis. If, however, histamine is administered, even at a remote date following the extirpation of the celiac ganglia, the abetting influence of celiac ganglionectomy upon ulcer production is observed. Perforated ulcers have been produced in monkeys receiving histamine following removal of the celiac ganglia, attesting the great abettment of postganglionic section of the gastric sympathetic nerve supply. Interestingly enough, if bilateral vagotomy is performed at the time of removal of all the prevertebral mesenteric ganglia (celiac, superior and inferior mesenteric), diarrhea, colitis, enteritis and ulcer do not develop in dogs.

When preganglionic section of the sympathetic chain to the mesenteric viscera is performed, the spontaneous occurrence of ulcer, enteritis, colitis and diarrhea is not observed (13). However, if histamine is given a month or more following recovery from the operation, ulcer within 5 days is observed about as frequently as in a control group of dogs (approximately 20 per cent). The incidence in dogs having preganglionic sympathectomy receiving histamine for 40 days has not yet been determined.

It would appear justifiable to conclude, however, that, preganglionic sympathetic section does not abet the ulcer diathesis; at the same time, it fails to afford real protection against the histamine-provoked ulcer. Prevertebral ganglionectomy (postganglionic section) however is a severe abettor of the histamine-provoked ulcer. The increased sensi-

tivity of the organism to epinephrine by post-ganglionic sympathectomy is undoubtedly, in part at least, a factor in this occurrence. It is proposed to determine when both are performed, whether the animal behaves predominantly like a dog with pre- or post-ganglionic sympathectomy.

A few instances of spontaneous occurrence of ulcer in man have been recorded following preganglionic sympathectomy during the past few years. Some years ago, when work was first begun upon this project in our laboratory, the writer communicated with a number of neurosurgeons and general surgeons who were studying the effects of sympathectomy upon patients. Only Penfield of Montreal at that time admitted having observed reactivation of an inactive ulcer after sympathectomy. The late Dr. Max Peet of Ann Arbor expressed the opinion that sympathectomy would in all likelihood afford protection against ulcer. Within the past few months, internists in that clinic have reported a few instances of the occurrence of ulcer after preganglionic sympathectomy as well as reactivation of inactive ulcers (17).

EVALUATION OF A SATISFACTORY OPERATION FOR ULCER

That surgeons have been too empirical in their approach to the surgical management of ulcer must be admitted freely. Moreover, we have been too imitative in continuing to perform operations, which someone has suggested, without knowing what was hypothecated or expected from the proposed operative procedure. In Poor Richard's Almanack, your Franklin wrote: "In the Affairs of this World Men are saved, not by Faith, but by the Want of it." Truer words never were spoken. The daily prayer of the surgeon might well be: Teach me to know the value of the self-discipline which comes from seeking the evidence for that which I would believe. Pollyannish surgeons who affect to instruct others may bring harm to others' patients as well as their own. No wonder John Hunter cautioned Edward Jenner: "Don't think; try the experiment." The shackles of speculative rationalization must disappear from the surgeon's code. He must strive to define specific objective tests which will assess the efficacy of his proposed procedures. And in biology, the only agency by which ideas may be subjected to experimental scrutiny is through experimentation upon animals.

The implantation of histamine-in-beeswax has been a very useful tool in assessing the alleged protective action of various suggested operations against recurrent ulcer. The procedures commonly employed by surgeons in attempting to thwart the ulcer diathesis, which have been tested for protective action against the histamine-provoked ulcer are shown in *Figure I*. Gastrojejunostomy and the small gastric resection fail to protect. The Schmilinsky procedure which consists of a small gastric resection accompanied by provision for complete intragastric regurgitation of bile and pancreatic juice also fails to protect. Only the operative procedures, shown as III and IVA appear to have a consistently good record in the dog receiving histamine, as well as in man (12, 25, 26).

It was the discovery by Edkins (1906) of the gastrin factor which suggested to surgeons that the small gastric resection (antrectomy) would be a superior operation to gastrojejunostomy in the treatment of ulcer. Gastrojejunostomy, gastroduodenostomy and various pyloroplasties, in their day, have had ardent and spirited supporters. Time, the final arbiter of all things, definitely has shown to the complete satisfaction of all men, who accept the testimony of fact, that, these operations fail to ablate the ulcer diathesis. In other words, the incidence of recurrent ulcer by all these operations is too high to justify their performance in the surgical relief of ulcer. It has taken more than a quarter of a century to do away with the fervor of enthusiasm for gastrojejunostomy as a curative operation for ulcer; and then still here and there, a voice would be raised again to suggest the virtues of gastrojejunostomy. In other words, whereas Time is a good referee, in matters surgical, the evidence is garnered too slowly. Employment of the

histamine-in-beeswax technique sets aside at once and for good and all, the futile rationalizations of hopeful speculation. It is easy to intoxicate ourselves with hope. Let surgeons always be mindful of this admonition!

As surgeons like Finsterer, watchful and critical of the accomplishments of operations for ulcer in their own hands, viewed the inadequacy of the small gastric resection (excision of the gastrin containing area), they extended gradually the level of excision such that, by 1934 Finsterer began to advocate the

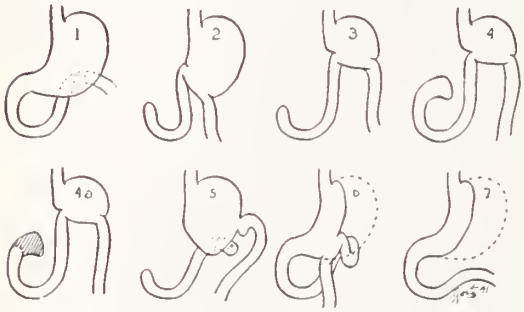

Fig. I. Types of operation which have been under scrutiny in patients and in dogs in the experimental laboratory. Only operations 3 and 4a appear to be acceptable operations. Dogs receiving histamine-in-beeswax develop readily large perforative ulcers after operations 1, 2 and 5. (Reproduced from *Archives of Surgery* (Wangensteen and Lannin) **44:** 489, 1942).

procedure which has gained in vogue, the world about, in the surgical treatment of ulcer: extensive gastric resection. Moreover, Finsterer and others were finding it necessary to excise the gastrin area in order to protect against recurrent ulcer. All surgeons who affect an interest in gastric surgery, have focused down rather sharply on this item.

A technical feature, in the performance of gastric resection, which the histamine-in-beeswax procedure helped to settle is the circumstance that, a long proximal duodenojejunal loop in the Billroth II operation is an ulcer-provoking procedure. Surgeons began to employ the long proximal loop in the belief that, a short posterior loop invited obstruction at the efferent stomal outlet. Over a number of years, this writer has indicated that, such obstructions are not fortuitous but man-made, and are owing to over-inversion of tissue. Demonstration of the circumstance that, a long duodenojejunal loop invites stomal ulcer should lead to discontinuance of its use. The items of proof have been discussed elsewhere and will not be repeated here (26). Kolouch's extensive studies confirm this suggestion. In a recent monograph on the subject, Mayo of South Carolina reviews the evidence in a comprehensive manner.

A SUGGESTED OPERATION FOR ULCER RECONSTRUCTING A MINIATURE STOMACH

The surgeon's present practice in the management of ulcer therefore is to excise the entire gastrin-containing area of the stomach and a fairly large segment of the acid-secreting area. This operation when done by the Billroth I or II technique appears to be a satisfactory operation in protecting against recurrent ulcer. One of its weaknesses is the rather frequent occurrence of the "dumping syndrome" observed in a large number of patients, particularly in the early postoperative months. Some patients, never rid themselves wholly of these undesirable side-effects. It is this occurrence, together with some experiences gained in the surgical management of cardiospasm, which has suggested the possibility of recasting the whole surgical problem of gastric resection for ulcer. In any case, it would appear to be worthwhile investigating. The question I have put to myself is this: Why not leave the entire gastrin-containing area and excise all but 5 or 10 per cent of the acid-secreting area? If all the acid-secreting area were removed leaving the antrum (gastrin area), such a procedure obviously could not invite ulcer. Therefore, the practical question is: how much acid-secreting area can safely be left without inviting recurrent ulcer? Moreover, such patients could have a residual stomach and a pylorus, and even though for some time they might have a small gastric capacity, possibly the "dumping syndrome" might not follow. In any case, the patients, who underwent this type of operation for the surgical relief of cardiospasm appeared not to exhibit the side effects com-

plained of commonly by patients who accepted sacrifice of a segment of their stomach together with the pylorus in the conventional Billroth II type of operation for ulcer. In any event, this train of thought has persuaded me to undertake a few such operations in instances of duodenal ulcer (Fig. II). At the same time, the efficacy of the procedure in protecting against recurrent ulcer is being assessed in dogs which are receiving histamine-in-beeswax. As yet, those experiments are not completed. Evidence thus far collected, however, would suggest that the operation does protect against the histamine-provoked ulcer.

Should the promise of this procedure be supported by a satisfactory experience in relieving patients of ulcer distress without the undesirable side-effects of the conventional gastric resection, and should it succeed uniformly too in protecting dogs against the histamine-provoked ulcer, the criteria of the satisfactory operation for ulcer will have been completely met in this proposed operative procedure. Obviously, it would be out of order in a patient with a highly obstructing duodenal ulcer, unless the patulousness of the pylorus and duodenum could be demonstrated at operation or corrected satisfactorily by a pyloroplasty; moreover, its performance would be contraindicated in an antral ulcer or in a gastric ulcer in which the possibility of confusion with cancer existed. Inasmuch as division of the stomach at that high level may impair transmission of vagus impulses to the remaining antral fragment, I am inclined to believe that this procedure should be accompanied by an effective pylorotomy on the pyloric sphincter. A wide anastomosis between the small residual upper acid secreting pouch and antrum is in order to avoid converting the remaining stomach into two loculi. A short Hofmeister type of inversion on the lesser curvature end of the upper residual gastric pouch facilitates the anastomosis, which can be carried out with a single row of interrupted sutures*. A complemental fairly long, open pylorotomy will preclude gastric retention should a temporary functional vagotomy attend performance of the procedure. In patients with any suggestion of pyloric obstruction, a pyloroplasty with partial excision of the pyloric sphincter has been carried out at the same time.

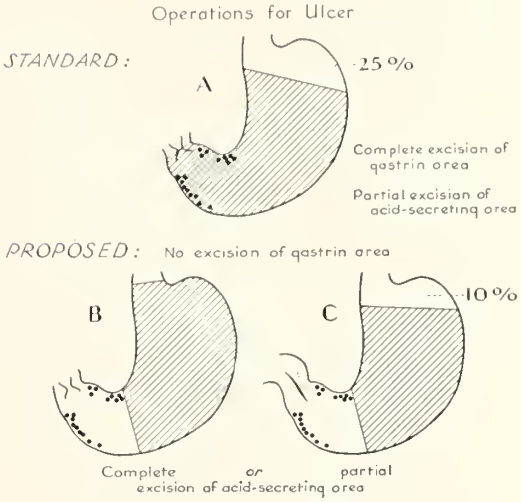

FIG. II. OPERATIONS FOR ULCER

A) The character of excision of gastric tissue as done today in the conventional gastric resection (Billroth I or II plan of operation).

B) A theoretic operation which obviously would ablate the ulcer diathesis. It should not be necessary nor would it be practical to excise that much acid-secreting area.

C) The operation I have been exploring in patients and in dogs, receiving histamine. A pylorotomy or pyloroplasty is necessary to preclude pyloric obstruction. My hope is that this procedure will ablate the ulcer diathesis and protect against recurrent ulcer just as operation A, when properly carried out does. In addition, I would like to expect that, it would not be attended as frequently by the "dumping syndrome" as in operation A.

CARDIOSPASM

My experience suggests definitely that, cardiospasm is not an acid-peptic linked manifestation of ulcer. Those patients who have dilated tortuous esophagi from cardiospasm have, in

* Whereas the surgeons in this clinic are very partial to the closed anastomosis, inasmuch as the antral mucosa retracts, very much in the manner that the esophageal mucosa does, we have found it necessary to employ the open anastomosis to avoid stricture formation when the upper tiny residual gastric pouch is anastomosed to the antrum.

effect, a "Hirschsprung's" disease of the esophagus. There is a pinch-cock like effect at the distal end and the proximal reaches of the esophagus exhibit loss of contractibility—hence the extreme tortuosity and dilatation in those instances of cardiospasm needing surgical relief.

Having performed gastric resection in 2 bona fide cases of cardiospasm without relief, I undertook the type of procedure outlined in *Figure III*. That experience has been very satisfying. Moreover, it was that experience which persuaded me to undertake the somewhat similar operation outlined above for ulcer. Considerably more experience, however, is needed with both procedures before I feel justified to speak out with conviction on these procedures. This I do feel impelled to say: over a number of years, I have had a modest experience with the Heller procedure of esophageal lysis and extramucosal myotomy as well as with the Heyrovsky operation of esophagogastrostomy. The early as well as the more remote results of the operation described herein for cardiospasm, in my hands at least, have given results far superior and more effective to those of the other procedures. The gastric hemorrhage and esophagitis producing

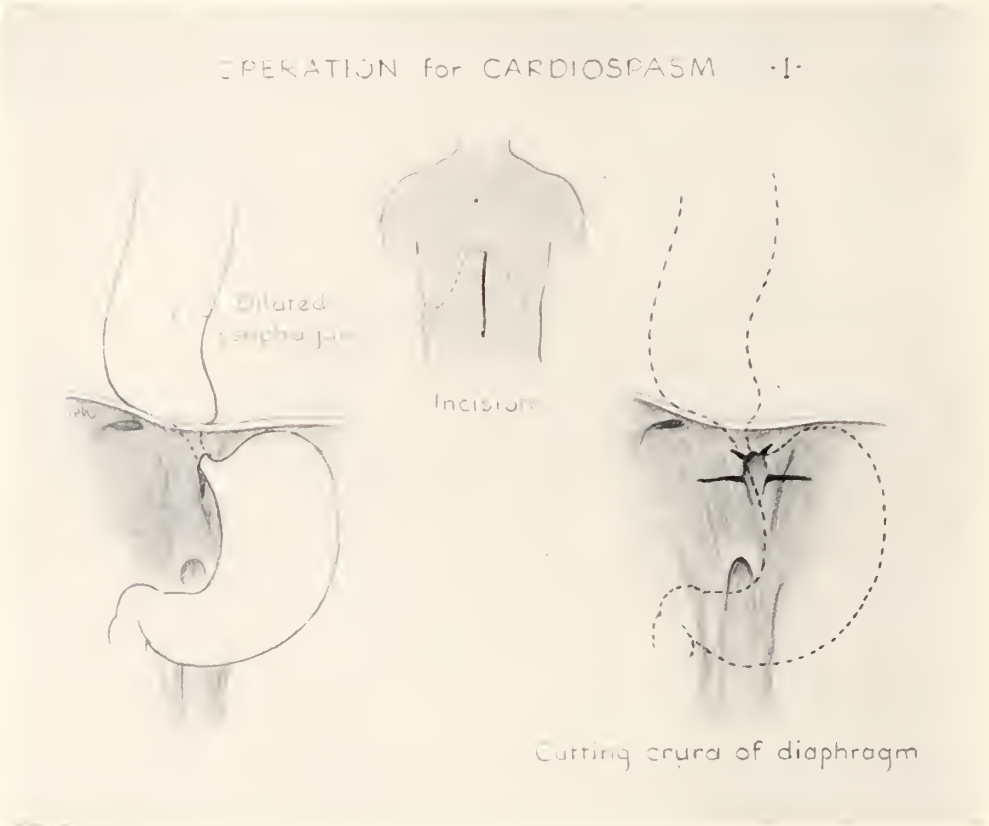

Fig. III. Operation for Cardiospasm

Plate 1. In this illustration the following are to be noted: incision (center); latterly, in addition, I have split the sternum longitudinally up from the xiphoid to the fourth or fifth interspace. This can be done extrapleurally and affords excellent exposure; the dilated tortuous esophagus (on the left), and division of the diaphragmatic crura (on the right), with added nicks in the central tendon of the diaphragm, to permit mobilization of the esophagus. Low division of the crura obviates opening the pleura.

tendency of the Heyrovsky procedure is eliminated by the operation proposed herein.

It would appear that the operation described herein for cardiospasm also would be an eminently satisfactory manner in which to treat the hemorrhage of so-called esophageal varices, described below under the bleeding of portal hypertension.

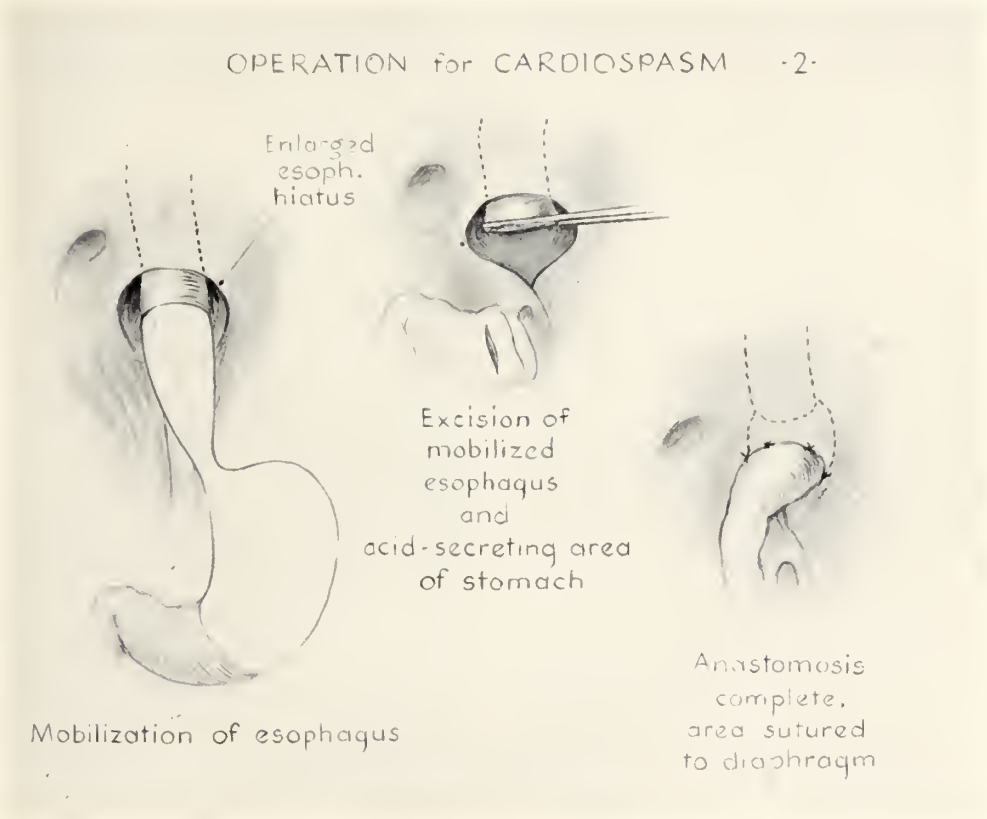

Fig. III.

Plate 2. Here the following items are to be noted: on the left, the extent of the excision of mobilized esophagus and diaphragm. The extent of enlargement of the esophageal hiatus by division of the crura is surprisingly great. The antral fragment of the stomach which remains after excision of the acid-secreting area (center) is anastomosed to the mobilized stomach. Buttress sutures are employed to fix the anterior wall of the antrum to the posterior wall of the esophagus, prior to starting the anastomosis. The situation on completion of the anastomosis is shown on the right. The edges of the diaphragm are sutured to the antrum to close the mediastinal opening.

SPECIAL CLINICAL CONSIDERATIONS

1. *Gastric ulcer*

Reports are accumulating to indicate that, approximately 10 per cent of ulcers believed to be benign are actually found to be malignant when excised and subjected to microscopic study. In others words, the threat of confusion is real.

In addition, there is the additional consideration that the complete healing of such ulcers is unusual. That is, complete mucosal epithelialization of the defect is unusual. Obviously, if complete mucosal restitution does not occur, a vulnerable area persists in the stomach, a circumstance which accounts for the frequency with which recurrent gastric ulcer is observed in the very same area after apparent healing as suggested by roentgen studies.

Of 13 gastric ulcers submitted to resection in this clinic and believed to be healed following varying periods of medical management varying from one week to three months, only one was found to be completely healed on microscopic study; one was a cancer and in eleven instances, there was still definite microscopic evidence of failure of complete epithelialization.

Alvarez and MacCarthy (1928) long years ago suggested that the large ulcer is frequently cancer. Experience has borne out that observation. The roentgenologist obviously carries a heavy responsibility in the manner in which his report is given. If the surgeon or pathologist cannot decide at operation in many instances without multiple sections and careful microscopic study, how can the roentgenologist know? Mere inclusion of the suggestion in his report that, "the possibility of cancer cannot be excluded"—such a report will serve to alert the clinician who feels completely dependent upon what the roentgenologist tells him.

2. *Hematemesis*

The most important source of mortality in ulcer is death from hemorrhage. Moreover, there has been little improvement in this hazardous complication of ulcer. During the past few years, there has been considerable improvement in the record of accomplishment in the management of perforated ulcer. A hospital mortality rate of 20 to 25 per cent was usual in the best surgical clinics for perforated ulcer prior to 10 years ago. That figure in the same clinics today is less than 5 per cent. Adequate closure of the perforation employing non-absorbable suture material, a better toilet of the peritoneum and the use of antibiotics, together with better postoperative treatment generally have brought about this betterment of the record.

It would be good to be able to say as much for the dangers of massive hemorrhage. From a number of hospital reports, it would appear that approximately 10 per cent of patients, admitted to hospital because of massive hemorrhage from ulcer, die. It is not a simple problem. Many patients come in shock, and the transfusion of blood does not immediately correct all the changes set in motion by a blood pressure which has been at shock level for a few hours. Lag phenomena must always be counted upon in such a calculation. Anyone who has seen a number of such patients and has had the opportunity of assessing them as surgical risks does not lightly recommend or undertake emergency correction of the hematemesis by operation.

The truth of the matter is however, that, if long delays could be eliminated after the appearance of hemorrhage, and early, or certainly earlier access to operation were the rule, there would be fewer deaths from hemorrhage. It is difficult for hospital staffs to persuade themselves of the necessity of taking a more aggressive point of view with reference to this important matter. It is so much simpler to continue to hope that the bleeding will stop spontaneously. I believe that, more and more, the decision to delay should be agreed upon by a surgeon and not made solely by the physician in attendance. In other words, a surgeon with a voice in the decision should see patients with bleeding from an ulcer on admission.

Obviously, when submitted to operation, such patients need an extensive resection. Moreover, the duodenal crater, the usual site of the bleeding, may constitute a major technical problem with reference to securing a satisfactory closure. This is especially true in the large supraduodenal craters.

3. *Erosions and the occult ulcer*

Old pathological literature contains many accounts of patients who bled to death and in whom at autopsy a small gastric erosion was found as the sole cause of the fatal bleeding. Surgeons and physicians alike have taken little heed of this warning. Many still feel that there must be an antecedent story of ulcer or at least x-ray confirmation of the presence of ulcer. It is my belief that in practically all instances, in which there has been frank hematemesis, the bleeding is of acid-peptic linked origin.

These patients, like many patients with bleeding ulcer, in which there is no question of the origin of the bleeding, are too ill to be submitted to x-ray examination. Patients, who have bled to shock level, or patients in whom the pulse remains hurried despite two or three transfusions, and patients, who have not suffered shock but in whom the hemoglobin continues to decline despite repeated transfusions —such patients, if they have *vomited* blood, in all likelihood, have an acid-peptic linked source of hemorrhage and should be submitted to surgical exploration, granted the physical condition of the patient will permit.

WHAT IS TO BE DONE AT OPERATION?

If a bleeding ulcer is detected, either by visualization of a scar or palpation of an indurated area or a mass, the diagnosis of ulcer is established. In many instances, however, nothing is to be observed or felt by examining the stomach or duodenum. In such instances, I make it a rule to examine the liver and spleen carefully and to measure the portal pressure. If the portal venous pressure is within the normal range, my experience suggests definitely that a three-quarter gastric resection will deal with the situation adequately. If the pressure is elevated, I do a total gastrectomy, believing that such patients have portal hypertension, for which the conventional gastric resection for ulcer will be inadequate.

The plan just outlined has been employed at the University Hospitals since 1944. The patients upon whom I carried out this procedure, described in 1945 (26), have remained well. Moreover, my associates have become fully persuaded that, patients with hematemesis in whom no lesion is found at surgery should be subjected to a three-quarter gastric resection. In practically all such patients an erosion is found high and slightly posterior on the lesser curvature. A few patients have presented microscopic evidence of ulcerative gastritis without a demonstrable erosion detectable by inspection of the stomach from within.

In some patients, largely women, with frank bleeding peptic ulcer of the duodenum for whom I have undertaken gastric resection because of bleeding, I have observed in several instances long afterward, suggestive traces of purpura such as petechiae or metrorrhagia. This occurrence has led me to practice and advise complementary splenectomy at the time of the gastric resection for bleeding ulcer, a procedure which I have continued to carry out in both women and men with bleeding ulcer.

The abettment of the ulcer diathesis by portal hypertension is of such a character that, the conventional three-quarter resection will not suffice. In 1945 (26), I advocated something akin to a total gastrectomy for the hematemesis of portal hypertension, performing a 95 to a 98 per cent gastrectomy. Since 1947, when the mortality of total gastrectomy in this clinic dropped sharply by employment of the posterior buttress in the esophagojejunal anastomosis, total gastrectomy has been performed regularly for the bleeding of portal hypertension. Whether it will ultimately prove to be as good a procedure as a portocaval shunt for the control of such hemorrhage remains to be seen. Certainly, the experience of this clinic on this score suggests definitely that, the hematemesis of portal hypertension is an acid-peptic linked occurrence and disappears when the stomach is removed. Patients with Banti's disease, who have no cirrhosis obviously withstand the operation of total gastrectomy better; moreover, the disease in such patients, with the cessation of hemorrhage, does not appear to progress in the same manner as it has in patients having portal hypertension on the basis of cirrhosis.

Since the experience published in 1945, many patients with interesting stories of hemorrhage have been seen. No more difficult problem has been encountered than that outlined in the case history which follows. It has significance enough for this discussion, I believe, to warrant repeating in brief outline here. Mr. E. M., Age 26, University Hospital No. 634105:

The patient was first admitted here in January, 1934 because of a febrile state. A diagnosis of German measles was made and also of acute myocardial damage. In December of

1936, he was readmitted because of a number of episodes of bleeding from the intestinal canal. Since the previous admission, there had been febrile episodes and a tentative diagnosis of subacute bacterial endocarditis had been considered.

There was no evidence of a hemorrhagic dyscrasia nor of a kidney lesion. The patient responded well to several transfusions and his abdomen was explored surgically on December 21, 1936 because of the repeated hemorrhages. The liver appeared normal. There were numerous clusters of vessels originating in the mesentery which seemed to envelope the entire circumference of very long segments of jejunum and ileum. There were four such major concentrations of clustered vessels about the bowel occupying the greater length of the small intestine. It could not be definitely stated, however, where in the gut the process began or stopped. The largest clusters were to be found in the upper jejunum. In many areas throughout the jejunum and the ileum, there were large vessels coursing over the external surface of the bowel. The appendix was removed and the abdomen was closed.

The patient was given x-ray treatment over the abdomen through a posterior portal with the thought in mind that these vessels might be hemangiomatous in character.

Because of periodic and continued bleeding and persistent anemia and persistent blood in the stool the patient was readmitted in May, 1942. It was then five and one-half years since the previous exploration. During the interval, the patient had had several intestinal hemorrhages. On admission again, he was pale as previously. The leukocyte count varied between 1250 and 2500. The hemoglobin was 15 per cent.

Exploration was undertaken with the thought in mind of excising a segment of the gut where the hemangiomatous character of vessels surrounding it was the greatest. The main segment of involvement seemed to extend from a point two feet distal to the ligament of Treitz to an area approximately six feet above the ileo-cecal valve. This was the area excised and the measurement carried out with a string over the surface before excision was 210 cm. The measurement after completion of excision by the pathologist was found to be only 115 cm. This segment of gut weighed 570 gms. No evidences of erosion or ulceration were found. The vessels over the serosa were dilated, but did not appear to be unduly prominent. The pathologist reported some dilation of the capillaries in the segment of gut microscopically. There was no lesion in the mesentery of the gut or in the gut itself which could be identified as hemangiomas.

The patient again had episodes of bleeding and came in for repeated hospital admissions because of persistent anemia and bleeding. On such occasions the hemoglobin would be in the area of 15 to 20 per cent. The patient was perspiring as if in shock and the pulse was invariably small and thready. Following a number of transfusions, the patient's condition would improve and he would be dismissed.

During the time the patient came here until the time of his last admission here in June, 1945, the patient had been transfused here or elsewhere a large number of times for shock or anemia.

In June, 1945, the leucocytes were in the area of 2450 to 2700 per cubic millimeter. The gastric acids were high. The fasting free acidity was 58° and in three successive periods after $\frac{1}{2}$ mg. of histamine, the free HCl in each specimen varied between 84 and 101° and the total acidity between 95 and 108°. The volumes were always large. There was consistently a 4+ Guaiac in the stool.

There were no gastrointestinal complaints other than the melena. X-ray studies for an ulcer were negative. The spleen was not palpable. The study of the bone marrow indicated marked normoblastic hyperplasia.

Because of these repeated stories of hemorrhage, I was inclined to believe the patient had either: 1. The ulcer diathesis or 2. portal hypertension with large vessels about the intestine. I hesitated to advise a gastric resection, inasmuch as a previous hemi-excision

of the small intestine had been done. However, I was inclined to believe on the basis of previous experience that, exploration was in order with a view to excising some of the stomach on the basis that this was essentially an ulcer-provoked tendency to bleed.

Operation was undertaken on June 22, 1945, after much discussion of the propriety of the undertaking with the patient's father who was a physician and with the patient himself. I explained to the patient's father that we would do a gastric resection; that in the event portal hypertension was found, we would do something akin to a total gastric excision; if on the contrary the patient's portal pressure was normal, I proposed doing a conventional 75 per cent resection on the Billroth II plan.

Operative Findings:

There were many adhesions from the previous exploration. The clusters of vessels which had been observed in the two previous operations were missing. The amount of small intestine remaining obviously was not great. The stomach was large and the external aspect of the duodenum anteriorly showed the typical evidences of what is called, frequently, duodenitis.

The portal pressure was normal, measuring 21 cm. of saline solution. The spleen was slightly enlarged; moreover, a small extra spleneculus was also excised. The liver appeared normal.

Operative Procedure:

Group III operation, 80 per cent gastric resection. Closure of the duodenum over Petz clips. A Hofmeister retrocolic anastomosis was made right at the ligament of Treitz. The indwelling gastric catheter was placed in the proximal loop.

When the stomach was opened by the pathologist, there were several erosions found. I had made a deliberate effort not to manipulate the stomach; moreover, no hemostats had been applied to the stomach.

The excised stomach weighed 200 grams; the spleen weighed 185 grams. The conclusion at the operation was that, the patient probably had had portal hypertension previously which accounted for the circumstance that the gut was surrounded by clusters of blood vessels at the first two operations.

The patient convalesced satisfactorily and has continued to do well aside from the circumstance that he has had difficulty maintaining his weight. There has been no evidence of melena since operation nor has there been intestinal bleeding of any sort. Moreover, the patient has maintained a satisfactory hemoglobin without difficulty by taking iron periodically.

Summary:

The case history of a man of 26 is recited who gave a history of eleven years of intestinal bleeding. On the occasion of abdominal exploration in 1936 (two years after onset of illness) and again in 1942, at which time, excision of a long segment of jejuno-ileum was done, large clusters of blood vessels surrounded the gut. The portal pressure then unfortunately was not determined. X-ray studies for ulcer were negative. Nevertheless, in 1945 gastric resection (80%) was done. The large clusters of vessels surrounding long segments of gut had disappeared. The portal pressure was normal.

The patient has remained well. There has been no more bleeding. Obviously, he had the ulcer diathesis. Did he have Banti's disease when the vessels about the gut were large?

4. *Esophagitis*

Elsewhere the susceptibility of the esophagus to injury by the acid-peptic digestive juice has been pointed out (28). The greater vulnerability of the esophageal mucosa to its action, over that of the gastric mucosa, is apparent in the following procedure. Dogs in which the pylorus is occluded by ligature and given 30 milligrams of histamine intramuscularly once a day, readily develop esophagitis or perforation of the esophagus, while the gastric mucosa remains normal. In fact, within four days, 50 per cent of dogs treated in this man-

ner, (and receiving saline solution to obviate dehydration and serious electrolyte changes) exhibit esophageal perforation; 100 per cent of the dogs have evidences of severe esophagitis with erosion, swelling and discoloration from hemorrhage; during this interval of time (4 days), the gastric mucosa remains normal. When acid-peptic juice obtained from an isolated dog's pouch is dripped into the esophagus of the cat, perforation will occur in 20 minutes (3)! The dripping of hydrochloric acid in the same range of PH(n/10) fails to produce any evidences of esophagitis after considerably longer periods.

In starved rats, in which the pylorus is ligated, the rats receiving daily 10 milligrams of histamine, erosions appear consistently in the proventriculus; in fed rats, otherwise similarly dealt with, the proventriculus remains normal, but erosions and evidences of esophagitis appear in the esophagus.

These observations together with the circumstance previously related, that patients needing dilatation of idiopathic esophageal stricture may be cured by gastric resection—these observations suggest to me that: 1. Idiopathic stricture or esophagitis is acid-peptic ulcer or disease of the esophagus; 2. spontaneous perforation of the esophagus in man is in all likelihood acid-peptic perforation of the esophagus.

It perhaps is not out of place to indicate here that, the patients with severe strictures of the esophagus who underwent gastric resection, and previously reported upon, remain well. Even Case No. 6, Mr. H. B., who had carried a gastrostomy for 8 years, because he could not swallow his saliva, gets on well now without need of further dilatations.

These occurrences together with the experimental production of esophagitis mentioned above appear in my opinion to justify the suggestion offered above that, both idiopathic esophageal stricture and spontaneous perforation of the esophagus are manifestations of acid-peptic ulcer of the esophagus. It is to be recalled that, Harvey Cushing, in his Balfour Lecture at Toronto (1932) on the Inter Brain enumerated several instances of esophageal perforation. Similar instances have been reported more recently as complications of brain tumor, or following operations for brain tumor (4). The vomiting, occurring as a complication of the increased intracranial pressure, frequently attending brain tumors, may reasonably be accountable for this association.

SUMMARY AND CONCLUSIONS

Employment of histamine-in-beeswax as a tool to explore ulcer production in animals suggests definitely that, there are essentially two factors in ulcer production: 1. an active acid-peptic secretion; 2. overcoming the resistance of the juxtagastric lying mucosae to injury by an active acid-peptic digestive juice. Agencies, which fail to augment gastric secretion, may nevertheless increase the susceptibility to ulcer in the presence of an active acid-peptic digestive secretion. Mechanisms which cause anemia of the gastric and duodenal mucosa may initiate a chain of events which lead to ulcer. Many of these are essentially adrenergic in nature. Some of these are: physical fatigue, cold, anoxia, hemorrhage, shock, anemia and hemoconcentration. Plugging or contraction of the end vessels of mucosae over which an active acid-peptic digestive secretion plies may lead to ulcer. Well known examples are fat embolism and the administration of vasoconstrictor agents such as adrenalin or pitressin.

The relief of esophageal stricture in patients undergoing gastric resection for ulcer suggests that, idiopathic stricture of the esophagus probably is acid-peptic ulcer of the esophagus. Moreover, the ease or production of esophagitis or perforation of the esophagus by ligature of the pylorus accompanied by administration of histamine, as well as by the dripping of gastric juice obtained from isolated gastric pouches into the esophagus—these occurrences afford convincing confirmation of the suggestion that, idiopathic esophageal stricture and perforation of the esophagus are manifestations of acid-peptic ulcer of the esophagus.

Cardiospasm is definitely, not an acid-peptic linked disease. The tortuous dilated esophagus of cardiospasm which needs the attention of the surgeon is essentially "Hirschsprung's" disease of the esophagus. The esophagus itself is atonic, hence the dilatation; it cannot overcome the spasticity of the terminal pinchcock-like segment. Straightening of the esophagus accompanied by excision of the distal 8 to 10 cm. of the esophagus together with the acid-secreting area of the stomach, constitutes a satisfactory operation for the relief of cardiospasm.

The success of gastric resection undertaken in patients with hematemesis in which the source of hemorrhage remained obscure suggests that such occult sources of bleeding, in many instances, have an acid-peptic linked origin, just as in frank acid-peptic ulcer of the stomach or duodenum. Gastric erosions and the hemorrhage of portal hypertension are the best examples.

The surgical relief of ulcer is to be undertaken in patients who have not obtained satisfactory relief by conservative treatment. A three-quarter gastric resection made on the Hofmeister-Polya plan of operation, with the anastomosis at or proximal to the ligament of Treitz is an acceptable procedure. However, the occurrence of the "dumping syndrome" in many such patients suggests definitely that, search is in order for a more physiologic surgical procedure. A suggested operation is described.

In the dog, a vagotomy appears to afford real protection against the histamine-provoked ulcer when unaccompanied by a simultaneous drainage operation such as, gastrojejunostomy or a small gastric resection. Either of these, however, employed as a complemental procedure to vagotomy impairs considerably the protective action of vagotomy against the histamine-provoked ulcer.

Prevertebral removal of the sympathetic ganglia to the stomach (celiac) is a severe ulcer abettor. On the contrary, whereas preganglionic sympathectomy (splanchnicectomy) affords little or no protection against the histamine-provoked ulcer, it does not abet ulcer production in the same manner as postganglionic visceral sympathectomy.

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An Ideal Program for Mental Health in Philadelphia*

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WITH the title "An Ideal Program for Mental Health in Philadelphia" confronting us, perhaps a definition is in order. To put it simply, an ideal is a goal always to be desired and never to be attained —if attained it is reality and a new ideal should be visible.

The mental health facilities which should be realities in the Philadelphia area are still only ideals. If we are to crystallize in mind something specific which would furnish what is needed, a somewhat detailed outline is necessary. The following outline and discussion of a plan has been formulated purely on a basis of need and adequate service, but with not the least reference to cost.† This approach is entirely reasonable and needs no further explanation being justified by the fact that good health has always proven a good investment.

A look at the problem of mental health, both horizontally and perpendicularly, shows areas of different significance. The field may be simplified in describing it in terms of:

Care
Cure
Prevention, Prophylaxis, and Education

These divisions bring to mind the old slogan of the Mental Hygiene Committee of the Public Charities Association, formed over twenty-five years ago, now renamed the Pennsylvania Citizens Association for Health and Welfare. That slogan was as follows:

Much for Care
More for Cure
Most for Prevention

and is still most apt.

Responsibility for mental health is more widely divided today than even a few years back. The National Mental Health Act has brought Federal responsibility into the scene and in the Philadelphia area we find also participating, the State, the City, and private hospitals, agencies, and professional personnel, both the profit and non-profit type.

These participants divide into two groups, with Federal and State facilities on one hand, the Municipal and Private facilities on the other. How these two rough divisions should function and co-ordinate will now be outlined.

LEVEL OF CARE

At the level of continued care obviously the burden must be borne by the State. Federal hospitalization of course will care for most veterans and private hospital care will supplement the State Hospital work. Psychiatric illness is so prolonged, and expensive, that an insignificant percentage of the population can afford more than a few weeks' care at the private hospital level of cost. Therefore, more beds must be provided for care and in such a manner that more long term patients may get well.

Currently accepted studies from several services generally agree that for the Philadelphia area at least 12,000 beds are needed for mental illness. The Philadelphia area, in terms of meeting the needs for the mentally

* S. Weir Mitchell Oration XII, *a*, The College of Physicians of Philadelphia, 4 January 1950.

† This article obviously must depend on a number of special sources of information and facts. The writer desires to acknowledge indebtedness to many who have advised in reference to the plan, and especially to assistance furnished by The National Mental Health Institute, U. S. Department of Public Health; and by Mr. Ross Sanderson of the Pennsylvania Citizens Association for Health and Welfare, The National Committee for Mental Hygiene; and The National Mental Health Foundation.

ill, means not only the city and county of Philadelphia, but also Chester, Montgomery, Delaware Counties and half of Bucks County.

Expansion of beds at Philadephlia State Hospital, Norristown State Hospital and Embreeville State Hospital, plus adequacy in quantity and quality of staffing is now being gradually accomplished. More is needed for an adequate level of care and it would be practical and progressive to establish a new State Hospital in Delaware County. Future hospitals of this type should be planned on a 2,500 bed basis—if we follow the majority opinion of hospital authorities actively engaged in the field today. Apparently experience shows optimum functional benefits for patients are most likely in State Hospitals of the smaller size near the 2,500 bed capacity.

LEVEL OF CURE

Overcrowding and understaffing, cumbersome admission procedures and general resistance still prevalent toward State Hospitals point clearly to the need for new small admission and treatment centers. There early acute illnesses, and repeated mental breakdowns of likely short duration should be admitted as voluntary or short term commitment for full study and modern treatment. In this area no one suffering from pneumonia, acute cardiac conditions or acute appendicitis finds it impossible to have immediate study and proper treatment. This is not the case for those suddenly mentally ill, and it is an equal responsibility for society and the State or City to make such aid equally available. That provided by private hospitals is very limited and becoming less as hospital costs increase rapidly.

In the Philadelphia area there is a need for five admission and treatment centers of at least 100 beds each—possibly as large as 300 beds, depending on geographical statistical studies. The types of clinical conditions suitable for admission here include young adults with their first or only attack of acute mental illness; complicated slowly developing mental disorders needing intensive study to determine proper treatment; older patients with a history of manic depressive or similar repetitive disorders which are known to respond well to short term hospital care and treatment.

The role of the contemplated plan to include psychiatric wards in general hospitals will be important here. The cooperation of private non-profit general hospitals and other general hospitals will allow some assumption of the clinical burden at this level of cure. Psychiatric wings in general hospitals (50 to 100 beds) can act as feeding units to State operated admission and treatment centers in the same manner as the State centers function in routing patients to the State Hospital when long term care or further treatment is imperative.

One of these centers obviously should be located at Philadelphia General Hospital. In addition to the other new centers, perhaps four in number, the admission buildings or services of the existing State Hospitals should be maintained with equivalent standards. Progress in research and treatment procedures, changes in the existing patient population resident in the State Hospital, and many other obvious reasons make it imperative to provide the best in cure, as well as care, in each State Hospital.

The relation of the State Psychiatric Institute to this level is important. Naturally clinical admissions to the Institute should be controlled on the basis of research projects undertaken. Admissions could be intelligently made, from early treatment centers, in addition to those selected from long term residents of the State Hospital System.

The greatest need in the Philadelphia area for inpatient study and treatment is in the pathetically neglected field of psychiatric disorders in children, which are showing constant increase. This means provision of a Children's Psychiatric Hospital or Center. Perhaps it could be operated at one of the Admission and Treatment Centers. Some believe it would be better to have such a center located in a suburban location where institutional big building restrictions could be at a minimum, allowing a broader progressive treatment program to develop under optimum conditions.

LEVEL OF PREVENTION, PROPHYLAXIS AND EDUCATION

How many Outpatient Clinics are needed in the Philadelphia area? It is doubtful if anyone knows the right answer. In any event any psychiatric outpatient clinic which finds itself busy furnishing mental health care or provision is a good investment. U. S. Public Health estimates that there are about 1/5 as many clinics as are needed in the country, and that one clinic to 100,000 people establishes a good proportion. This indicates approximately 20–25 clinics would be necessary for adequate coverage in the Philadelphia area.

The State Hospitals and the admission and treatment centers should maintain their own outpatient department. These are valuable not only as diagnostic clinics but for the treatment and maintenance of patients thereby often avoiding hospitalization. It is amazing the effective work that can be done on an outpatient status not only with psychoneurosis and situational maladjustments, but with frank psychoses. The outpatient clinics for the State Hospitals could also function further in treating patients who have been discharged, and supervising patients if there were a farming-out plan maintained in this area. The State Psychiatric Institute would be a logical location for an active outpatient department especially interested in research with outpatient psychotherapy.

Outpatient departments under State supervision control or in general hospitals under private control should integrate their services so that experienced child psychiatrists could furnish adequate treatment for the psychiatric problems of children. The Health Centers contemplated for many general hospitals in the city area should be Health Centers including mental health, especially the mental health of children. Coordinating function of the childrens' sections with the Philadelphia Child Guidance Clinic would be important.

Staffing general psychiatric outpatients means utilizing experience rather than theory. Widespread outpatient clinical experience demonstrates the efficiency of the team plan. The functional relationship of psychiatrist, psychologist, and social worker, adding in certain locations the psychiatric nurse, give the greatest promise in delivering service. Mental illness does not mean just schizophrenia and manic depressive psychoses, no more than physical illness means tuberculosis or cancer. Sir William Osler once said that the fate of the tuberculous depends more on what they have in their heads than on what they have in their chests. What we enable patients to utilize in their heads may help determine their attitudes, security, job, and home adjustment, as well as mental health. The valuable clinical service of the experienced psychologist and the trained psychiatric social worker who may work under the supervision of a psychiatrist in an organized psychiatric clinic must be developed in the face of the great community need for psychiatric outpatient service. Remaining completely undeveloped in the psychiatric field are the services of the Visiting Nurse or the Public Health Nurse, particularly in the city areas where social psychiatric situations are so significant. Even on inpatient service psychiatrists fail to use the therapeutic power and the interpreting capacity of the nurse who is with the patients perhaps twenty-three hours a day, associated with the patients' eating, dressing, bathing and behaviour, the primary function of their living. Consider the picture that the Visiting Nurse gives of the local environmental situation, the home, social, economic, and emotional situation, and how she can be properly trained to influence these in a constructive manner.

Coordination with private hospitals, psychiatrists in private practice, and non-profit psychiatric outpatient facilities is needed in a city-wide program more than in any other level. The standard of treatment by practicing doctors and specialized out-patient units set a pattern for the community. The help of private units in aiding, establishing and maintaining standards of individualization in therapy is vital. Psychotherapy is the most personalized job in any specialty in medicine. Psychiatry and psychotherapy, least of all specialties, can

be fitted qualitatively into the proposed plan for socialized medicine. President Stassen, of the University of Pennsylvania, in a recent *Reader's Digest* article, summarized his impression of the British socialized medicine plan now functioning as follows: "More medical care of lower quality for more people at a higher cost." Many of us are familiar with the blocks in psychotherapy, in working with personnel in the armed service. We also know some of the problems connected with the making of records and the attitude of patients if they consider their records are public property. Whatever these difficulties may be no outpatient system will be worthwhile unless its therapeutic endeavors are maintained at a high standard. There can be only high quality psychotherapy, any other destroys itself and is truly non-existent.

At the end of the line where the responsibility stems from the Bureau of Mental Health through the District Director of Mental Health we see the proposed Office for Mental Health Education. This office can tie in all the varied and manifold problems of special service, training and education. The training of psychiatric personnel should be carried on in every clinic and every hospital as part of its on the job training program and as part of its educational capacity. The medical schools should be affiliated with, and using, all State Hospital units, and the nursing schools should have an active program of affiliation in these units. There is a wealth of teaching material available and the conduct of teaching programs will benefit not only the situation but the hospital personnel and patients. The Office for Mental Health Education should aid in establishing a program of rotation for all professional personnel. No expert in the outpatient department is qualified unless he is fully experienced with the chronic illness of the State Hospital and knows the problems of admission, treatment, and discharge. The transfer of personnel between admission and treatment units to the State Hospitals will establish stimulation of retrial of treatment. The whole system, extending from the outpatient department in the community, to the State Hospital is no better than its weakest link in terms of adequacy of personnel.

The Office for Mental Health Education is the logical center for all types of educational courses, not only for professional personnel but information courses for all levels in the community. Courses could be planned not only in relation to the professional personnel available but in terms of the function that each clinical unit performs in its community area.

The community is full of consulting services, some with both state and federal support, and some with private and/or municipal backing. The coordinating power of the Office for Mental Health Education in forming theoretical teams or consultants who can be used part-time or full-time for various community activities would be very practical. There is some spasmodic consultation available from the psychiatric standpoint, in certain social agencies and occasional institutions, but there is little organized unit activity in the community with the exception of the psychiatric clinic of the Municipal Court and that carried on for the public school system. Otherwise, what is done is done by individuals, usually as volunteers on part-time basis, and part-time paid personnel, which in a community of this size is highly disorganized and inadequate. There are psychiatric problems where a real contribution could be furnished by consultants in the State schools for the blind, or deaf, in the correctional institutions, rehabilitation services, business and industrial management, labor organizations, employment and civil service, housing authority and slum clearance and many others, too numerous to mention. Effective utilization of the experience that psychiatry has gained from the problems of mental health in the community would be worthwhile not only in terms of dollars saved, but also because of the contribution to personal happiness, efficiency, and better mental health.

CORRELATION

No matter how much outpatient or inpatient care by privately practicing psychiatrists or

by private non-profit hospitals and social agencies may be available, the responsibility for adequacy belongs to the State. Grants from Foundations, and from Federal sources will aid research and training of personnel, but lags perpetually behind real needs.

Forthright assumption of care and cure by the State, makes it desirable to also reach back into prevention and prophylaxis not only to meet human needs but as sound economy. Every aggressive program undertaken by a progressive State Authority has immediately been strengthened freely and generously by Federal support and private funds.

Correlation of the interlocking interests is difficult but should be centered in some central coordinating point. Obviously the Bureau of Mental Health, or a Commissioner of Mental Health is a logical center for such coordination at the State level. In the Philadelphia area there should be a subordinate office which might be known as the District Director of Mental Health.

The District Director could facilitate and develop the cooperative flow of patient admissions and care, not only for inpatient but also for outpatient services. His office would be responsible for the formation of the important Consulting Services which would be so important as service teams to the many community agencies where prevention may be so effective. The Office for Mental Health Education would be part of the responsibility of the District Director, with a wide program of public education that is so important in shaping the attitudes of large segments of the normal population toward the psychiatrically ill and their essential needs, as well as in developing all phases of a practical mental hygiene program.

These offices and levels of administration, though State controlled and a Commonwealth responsibility, and carrying authority over State institutions and agencies, can at the same time act as coordinating points with institutions and agencies under Federal, private, and Foundation authority. This type of coordination carries within it economy and effective implementation of all existing forces that can meet the problems in mental health.

Some Psychiatric Aspects of Delinquency*

By WINFRED OVERHOLSER, M.D., SC.D.

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SILAS WEIR MITCHELL, whom we are met tonight to honor, was one of Philadelphia's great. Possessed of a broad medical background and an inquiring mind, he added much to the medical knowledge of his time and was the first of the great American neurologists, as well as an outstanding psychiatrist of his day. He lived up to the high medical traditions of Philadelphia, a city which has boasted, and still boasts, many other distinguished physicians. The names of Rush, Physick, Da Costa, Spiller, Keen and the Peppers, to mention only a few, constitute a galaxy of which Mitchell was one of the bright particular stars. His literary productivity was amazing (he has been referred to as "one of the most incorrigibly active men in modern medical history".) and his fame as novelist and poet is still undimmed. "Literate" physicians, in the broadest meaning of that term, today are all too scarce, thanks in large measure to the overstrict requirements of the so-called pre-medical education. Let us hope that the day will again come when physicians will be encouraged to take an interest in the humanities and be given time in their academic training to become truly educated men.

If Dr. Mitchell were living today he would be greatly interested in the law's growing understanding of the bases of human behavior. To a psychiatrist it is particularly heartening that the law which deals with offenses against society, that is, the criminal law, has for the past 50 years gradually been preparing itself to recognize that all mankind does not consist of the wholly sane and the wholly insane, but that there are varying shades of "gray", that indeed each offender is a unique phenomenon, that he has his own peculiarities and his own background, all of which should be considered in dealing with him. Delinquency, to use the broader term covering deviations from legally acceptable conduct, has always been of interest and concern. Every generation since the dawn of recorded history has lamented the shortcomings of the younger generation, and has viewed with alarm the "crime wave" of its period. With the development of criminal statistics and of news media this concern has become greater. Apparently there has been an increase in the number of juvenile and adult offenses in the past decade, although the extent and significance are not clear. Just now we find ourselves in the midst of an alleged wave of "sex offenses", but of that more later.

Public attitudes toward delinquency have varied through the ages. In Biblical and classical times, for example, the law of retribution, the *Lex Talionis*, was the prevailing rule, as exemplified in the Biblical injunction "to pluck out thine eye if it offend". In the Middle Ages, with the rise of the theological point of view, considerable interest was expressed in the moral state of the offender. The attitude toward him, however, was still a decidedly harsh one, and capital punishment was frequently invoked. Indeed, at the time of our American Revolution it is said that at least 150 capital crimes were listed on the statute books of England! At about that same time an Italian, Beccaria, in a little volume which has had a tremendous impact upon the views of penology, protested against the capricious sentences then being imposed by the European courts, and proposed what might be termed a quantum theory of punishment, that is, the proposition that a certain amount of pain would be just sufficient to counter-balance the amount of pleasure derived by the offender from committing his offense. Fifty years later,

* S. Weir Mitchell Oration XII, *b*, The College of Physicians of Philadelphia, 4 January 1950.

the Commonwealth of Pennsylvania started a new method of penal treatment in its so-called "silent system" at the Eastern Penitentiary. Stress was still being laid on "moral depravity" and enforced "penitence".

The interest in the individual offender really started with Lombroso, the Italian anthropologist, about 75 years ago. Many of his conclusions were wrong, but he did direct attention to the individual offender as such; from that time impetus was given to the development of such new methods as probation, reformatories and special methods of dealing with juvenile offenders. Psychiatry was a late comer to the scene.

William Healy, starting his work in the Chicago Juvenile Court in 1909, was really the pioneer in the field not only of child guidance but in that of the application of psychiatry to the problems of juvenile delinquency. Bernard Glueck a few years later made his observations on adult offenders at Sing Sing. Since then there has been a growing interest in the motives of the individual offender and in the best way of restoring him to society as a useful citizen. Alongside the study of individual psychological factors has gone the very productive work of sociologists, social psychologists, and cultural anthropologists concerning the environmental factors in delinquency. Indeed, it is more and more being recognized that the study of delinquent behavior is a joint project in which the techniques of sociology, anthropology, psychology, and psychiatry must reinforce each other.

Psychiatry as a specialty of medicine has come far in its relatively short history. Starting at the time of the French Revolution under the Italian Chiarugi and the great French psychiatrist, Pinel, its primary interest was in the hospitalized mental patient. Kindness, occupation and pleasant surroundings constituted virtually all of the psychiatric treatment then known. It was systematized by Kraepelin, commencing about 60 years ago, but it is primarily through the genius of Freud that much was learned of the mental mechanisms of behavior. Not only have great strides been made in the psychological therapy of the psychoses and of the neuroses, but psychiatry has shown itself to be a valuable aid in general medicine, in industry, in the court, in marriage counseling and in the school. More emphasis is being laid on the preventive as well as the therapeutic aspects. At the same time psychiatric social work has been developing as a diagnostic and therapeutic aid, since the environmental factors are highly significant in the development of behavior disorders. Indeed, as more has been learned concerning behavior the more clearly has it come out that no given act is the direct outgrowth of any one factor.

No two persons have the same combination of genes, nor are any two subjected to precisely the same environmental influences. People differ in their intellectual capacity, in their temperament, and in their emotional response to their parents, their siblings, and their schoolmates, and everyone's reaction to a given situation is conditioned by all that has gone before in his experience. As the child develops he soon learns that instinctual gratification is not unqualifiedly possible, that there are prohibitions which mean that desires must be limited in their outward expression if the approbation of the parents or other authoritarian figures is to be maintained. Feelings of guilt, hostility against the father and compensation for feelings of inferiority are often the basis for very considerable emotional conflict. Studies have shown how frequently they are expressed in delinquent behavior. The work of Line and Griffin in Toronto and of Bullis in Wilmington, Delaware, has indicated that tendencies toward seclusiveness or undue aggressiveness may become evident in very young schoolchildren. The significance of this observation for the possible prevention of later mental breakdown or delinquent behavior is considerable. Many delinquents express strong feelings of rejection or of being unwanted at home; this is perhaps especially true of children who have been reared in families in which there has been parental disharmony or alcoholism, for example. It is noted as well in chil-

dren raised in orphanages and sometimes in those who have been brought up by unsuitable foster parents.

One basis for a feeling of insecurity is to be found in children of limited intelligence who must attend schools in which no provision is made for any but the so-called average child. The special classes in the public schools are a valuable preventive of delinquency as well as aiding in the development of potentialities in the subnormal child. Not all delinquents, of course, are of inferior intelligence; some indeed are well above the average, but have exhibited serious emotional conflict as a result of their early influences. The rôle of intelligence, or lack of it, as a basis of delinquent behavior is now recognized as decidedly secondary to that of emotional conflict.

One caution should be uttered at this point. A measurable amount of delinquent behavior, whether in children or in adults, is due to mental disorder of a degree which may be psychiatrically classified, or at least that may be the conditioning factor. Some children are incipiently psychotic, of low or frankly defective intelligence, or neurotic; there is also that relatively small group which falls in the category known as psychopathic inferiority or psychopathic personality. There are, however, numerous offenders who may be classified as accidental or occasional, in whom the behavior is largely conditioned by social or environmental influences. I mention this fact because psychiatrists are now and then accused of wishing to treat all offenders as mental patients, as "cheating justice", or as "coddling criminals". Psychiatry wishes to treat those who come within its sphere but it does not claim the entire range of mankind as its scope of action!

One type of delinquent behavior which has been attracting a good deal of public attention of late is that committed by the so-called "sexual psychopath". The newspapers, with that facility familiar to headline writers, have been depicting the country as in the throes of a wave of sex crimes, and the demand has even been voiced that sex offenses be made a Federal offense in order that the F.B.I. may "come to the rescue" of the States! It is a fact, of course, that there have been recently several murders of young children involving rape as a preliminary to a brutal killing. Such offenses are highly dramatic and stir great public dread as well as anger. Certainly any one of these murders is too many, but whether or not we can truthfully be said to be engulfed in a wave of crimes of this sort is doubtful. Anyone who has had experience with the vagaries of reporting by the various police departments, with the hesitation of complainants to report offenses, and with the multiplicity of names under which offenses may be catalogued is bound to be somewhat cautious in interpreting the meaning of criminal statistics. Some British figures recently published (1) appear to indicate a substantial increase in certain offenses reported in the past decade, such as "unnatural offense" and attempts, indecent assault, and rape. Furthermore the term "sex offense" is a widely inclusive one. Indeed, if the Kinsey report is to be taken at face value there are few adults who have not at some time or other been guilty of committing one, at least, of the many proscribed acts enumerated in the statutes of the several states! There are certain types of sexual offense, however, which cause a great deal of concern, and properly so. Notable are those in which a child is the victim and an adult the offender (molestation, attempted carnal abuse) and those sexual offenses involving force, whether exerted upon a child or an adult. Perhaps the most common of these offenses is what is known as "indecent exposure" or "exhibitionism"; another frequent one is the making by adults of sexual advances to young children, male or female. This is often reported as attempted carnal knowledge or attempted rape, and some of these cases have certainly led to homicide. There are numerous cases in which sexual acts occur between adults of the opposite sex or of the same sex by mutual consent. On the Continent these acts are systematically disregarded, and some of them are very rarely prosecuted even in this country.

The important thing about these offenses, particularly those involving children, is that the public is coming to have a general recognition of their pathological nature. The offenders are looked upon as "queer", and the offenses seem to be repeated on a compulsive basis. Michigan in 1937 was the first state to enact a law providing for the indeterminate commitment of "criminal sexual psychopathic persons", and now no less than 13 jurisdictions have laws of this type. In most instances the law specifically recognizes that offenders in this group are not to be considered as "insane". They are, as Sir Norwood East, the eminent British forensic psychiatrist, puts it, "non-sane, non-insane offenders". In most cases the commitment is for an indeterminate period, and in some states the person charged may be prosecuted for the offense leading to his arrest after he has been released from the mental hospital to which he has been committed.

From the administrative point of view it is extremely interesting to see for almost the first time a recognition in the law of a category midway between fully sane and fully insane or feebleminded. Perhaps it points the way toward a time when the courts may cease to fix sentences or determine places of punishment or modes of punishment and instead may confine themselves, as long ago suggested by Sheldon Glueck (2), to the determination of guilt. Under such a plan, the penal or correctional treatment would be determined by an administrative board in which psychiatry would be represented along with the other social sciences.

From a medical point of view there are some interesting features of the "sexual psychopath" legislation. The concept of psychopathic personality is an old one. Indeed, Pinel in 1801 (3) described a condition which he referred to as *manie sans dêlire* (mania without delirium), a condition, as he put it, in which the patient had no lesion of understanding but was under the dominion of instinctive fury. Prichard (4) in 1835 referred to "moral insanity", in which there was presumably a morbid perversion of feelings and impulses without a disorder of the intellect; it is to him that the credit is generally given for the first formulation of what we now refer to as psychopathic inferiority, constitutional inferiority, or psychopathic personality. As the term "constitutional" in some of these synonyms implies, the condition has been looked upon as essentially almost untreatable, and psychiatrists have tended to take refuge in this alibi for therapeutic failure by enlarging to a considerable extent the types of deviant behavior which were so classified. By more than one psychiatrist the term "psychopathic personality" has been referred to as a psychiatric wastebasket, and it has in the hands of some psychiatrists become so inclusive as to have virtually no clear meaning. It is apparently upon this assumption of untreatability that a psychiatrist has recently proposed that "sexual psychopaths" should be sent only to prison until such time as the psychiatrists have knowledge as to possible treatment!

The fact is that more recent studies upon cases of so-called criminal psychopaths, not necessarily sexual offenders only, notably by Karpman (5) and Maughs (6), have indicated that the majority of offenders who have been diagnosed as psychopathic personality are essentially profound neurotics, largely of the compulsive type, and therefore not unamenable to treatment. There is, however, a small core, of as yet unexplained psychogenesis, who are completely lacking in conscience and feelings of guilt and in generous emotions, who are almost savagely selfish, for whom Karpman would use the diagnosis of anethopathy, that is, an abnormal condition in which there is a total lack of ethical feeling. Many of the paraphiliacs, that is, the molesters of young children, and homosexuals, for example, are essentially neurotics, heavily loaded with anxiety and guilt, who react by a state of unrepressed hostility and by a tendency to regression of fixation at a much earlier stage of psychosexual development. The psychological dynamics are sometimes very clear, and not infrequently the patient will respond to

psychotherapy. For the benefit of society and the offender, the attempt at treatment should be made. The great difficulty, however, is that some of these offenders are quite content to remain as they are, thus remaining inaccessible to treatment in spite of prolonged confinement. If they do not respond, the protection of society is best assured by their segregation for an indeterminate period. Certainly the all too general procedure of fines and brief imprisonments has well demonstrated its complete bankruptcy as regards this group of offenders!

The views of Karpman and Maughs seem to be well borne out by the experience at Saint Elizabeths Hospital, where for about one and one half years sexual psychopaths have been received under the laws of the District of Columbia. It is of some interest that in that space of time in a city of nearly one million only 17 such patients have been received. This would seem to indicate a considerable conservatism on the part of the prosecuting authorities, and it is even possible that the most treatable are not being committed under the law. Our experience has been that there is a wide variety of mental mechanisms at work and in at least two of the cases involving older men there is some evidence of cerebral arteriosclerosis, suggesting the factor of early brain damage as weakening the defenses of the personality against neurotic trends. About seven of the patients have been arrested for charges involving indecent exposure. They seem to be an unusually passive group, who adjust themselves very well to institutional life but appear quite content to remain exhibitionists. A number of them have a history of prolonged enuresis in childhood, coupled with threats which might be interpreted by them as castrative, fears against which they were reacting by their behavior. It is doubtful whether this group presents a serious threat of violence, so great is their passivity. Probably the most serious threat is presented by the offender who makes sexual advances to small children (the pedophiliac); his activities tend to be compulsively repetitive, and may eventually lead to homicide (7), particularly if the victim resists or cries out. A few of the patients only appear to be true psychopathic personalities (8). Two case histories given in brief may be of interest as indicating some of the early roots of the difficulty:

A. B., 35 years, single, was born in the south, one of four children. The father was subject to tantrums, while the mother tried to maintain the "genteel" tradition. The patient had an intense jealousy of his sisters, and was a behavior problem in school and at home. Sexual activity, with children of both sexes, began at age eight, and he had been highly promiscuous. Although possessed of a college education, he has been a taxi driver, as if deliberately trying to degrade the family tradition. Much unconscious hostility to his mother and sisters is found on investigation. More recently, feeling more uncertain of his prowess with adults, he has made advances to children, and while engaging in mutual masturbation with a mentally defective girl at a theatre was arrested. He shows some evidence of early schizophrenia, but has fair insight and is concerned over the implications of his homosexual activities. He summarizes himself as "five years old emotionally with a 35 year old body". He has shown considerable improvement under active psychotherapy.

C. D., 35 years old, married. His mother was abusive to him in his early years, and he spent a large part of his childhood in the home of foster parents. His foster father is reported by him to have been exhibitionistically inclined. He has led a somewhat roving life, has been promiscuous sexually with women, has been married twice, and has two children. For the past seven years his neurotic over-valuation of his penis has led him into numerous brushes with the law on charges of indecent exposure. He has been twice in mental hospitals and has served several sentences, but with no improvement in his conduct. He has usually exposed himself to girls of four or five years and in some instances has made attempts at sexual

contact with them. The frequent and compulsive nature of his acts, and the aggressiveness accompanying them make him a menace. He is a neurotic pedophiliac of doubtful prognosis.

One point stands out clearly. In a number of cases it is quite evident that other previous offenses have not been reported to the police because the parents of the children involved fear publicity. In some cases, indeed, the police have changed the charge in order to avoid the necessity of using a child as a witness. This suggests the desirability of employing the juvenile court procedure whenever possible since under that arrangement the court is cleared; there is no publicity, and the feelings of the child can be protected as much as possible. As a matter of fact, many States give the juvenile court power to act against adults charged with "impairing the morals of a minor".

Perhaps enough has been said to indicate that delinquency is a subject with many facets. The psychiatrist is interested in his contribution to the problem both after the offender has been apprehended and as an aid in preventing the delinquent conduct. Of course he cannot work alone; many social factors are involved. First of all, the home is of basic importance, particularly as a means of giving the child a feeling of security and of being wanted. In addition to a feeling of security the inculcation of right conduct is important, the building up of the ego-ideal. The various character-building agencies, such as the Boy and Girl Scouts, and particularly the church, are valuable corroborants of the home, but they cannot take its place.

Every child is eventually exposed to the influence of the school; here is a potential of vast importance. The school as an educational institution has long been valued, but its socializing value has sometimes been underestimated. The fact that children are not all of the same ability intellectually has been recognized over a long period, and the development of special classes, particularly for the backward, has already been mentioned. It has sometimes seemed as if the advanced child, the bright or precocious child, has fewer opportunities than the dull! This pupil, if not kept intellectually interested, is likely to become restless and become involved in various difficulties. In addition, the school has an opportunity to detect symptoms of emotional maladjustment (early schizophrenia, for example) as indicated by various conduct disorders or by undue seclusiveness. Only this year the legislature of Pennsylvania provided for the referral to a psychologist or psychiatrist of any pupil in need of such special examination and the further reference of such pupil to a psychiatric clinic if deemed advisable (9).

That the teacher should be trained in mental hygiene principles is a natural corollary of what has already been said. Also, adequate clinics should be made available, and institutional care if needed for children showing serious behavior disorders. Pennsylvania, let us note, was the first state to provide special facilities for the care of problem children in its state hospital.

As for the courts, particularly the juvenile courts, further facilities for psychiatric advice and supervision are needed, although here again we are faced by the unpleasant fact that adequate numbers of trained psychiatric personnel are not available. On the broader social side one may mention the desirability of foster home care as against that provided in orphanages for children who are neglected or dependent. Needless to say, too, the education of parents is a desirable goal but probably a remote one, although there are signs that a wider public comprehension of the principles of mental hygiene is well on the way.

The problem of delinquency is an old one and a difficult one, with ramifications into many fields. The psychiatrist, the physician who is particularly interested in deviations of behavior, does not by any means have all the answers. He is, however, interested in the individual's reaction to his environment and considers that he can offer at least a modicum

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of help, not only in treating delinquency but in preventing it.

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Medical History in Medical Words*

By O. H. PERRY PEPPER, M.D.

MEDICAL history has perhaps concerned itself too much with men, discoveries, and with dates; too little with the flow of thought, the slow growth of concepts, the changing views and philosophies. It is amazing to find that even a superficial study of the derivations and origins of the scientific words we use, often vitalize a long past period of medicine, and reveal the thought of that time and the level of its scientific knowledge. Take, for example, the familiar word carotid—the name of the large artery in the neck.

The word carotid is derived from the Greek, karoun, which meant to stupefy or put to sleep. There is an illuminating story back of this unexpected derivation. In ancient Greece the peripatetic mountebanks as a feature of their shows caused a goat to fall unconscious by pressure on the carotid arteries in the neck, and to return to normal when the pressure was relaxed. This was given credence by Morgagni (1682–1771), but John Bell later scoffed at him for doing so. Still later Astley Cooper and others, however, demonstrated that in goats and horses, but not in man, the carotids supply the entire blood flow to the brain and in 1896 Leonard Hill in his famous book on the cerebral circulation wrote "So in spite of Bell's scoffs, the mountebanks were in the right." And so, of course, was Morgagni.

This story not only has a human historical interest, but it tells at once a little something about the great Morgagni, the cocksure John Bell, the careful Astley Cooper and the sly humor of Leonard Hill. It also reveals the slow advance of knowledge on a single minor anatomical point. It teaches us once again not to be too sure another person is wrong. Incidentally, Leonard Hill did much of his research while a Research Scholar of the Worshipful Company of Grocers.

The eminent medical historian Karl Sudhoff wrote a very sound essay entitled "What is History of Medicine?" in which he decries the habit of dating everything from Hippocrates "although (as Sudhoff writes) we now know that not only in those parts of Asia Minor where Greek was spoken and in the outlying islands, many an able medical thinker flourished before Hippocrates, and that to the Greeks the name of Hippocrates did not represent the beginning of medical science and medical art."

Sudhoff is very right in this, but nevertheless in the field of medical terminology it is to the Hippocratic writings we must turn for the first appearance of much of our medical vocabulary. Of course, Hippocrates merely recorded the current terminology including such modern sounding words as arthritis and pneumonitis, but we do not know their earlier history. Egyptian contributed words including the root of hyalos, meaning glass, which we use in hyaline, and from Crete came a group of terms ending in nth or nx, such as for example, salpinx and meninx from which we get salpingitis and meningitis. But the bulk of his vocabulary was of earlier Greek origin. A mere listing of the Hippocratic glossary would give a reasonably good picture of the medicine of that era.

Sudhoff in the same essay writes that the answer to the question "What is History of Medicine?" "will vary and depend upon how much the questioner or the person questioned knows of the subject matter, how deeply he has entered into the spirit of medical history; upon the range of his aims, his inclinations and his

* The Kate Hurd Mead Class of 1888 Lectures in Medical History, The Woman's Medical College of Pennsylvania. I. Delivered 13 January 1950 at the College of Physicians of Philadelphia, under the joint auspices of the College's Section on Medical History and the Woman's Medical College of Pennsylvania.

capability to rise above daily routine and the clamor of prevailing opinions."

"One man will shrug his shoulders and superciliously speak of an old curiosity shop; another will call it a catalog of exploded theories; to another, who has had just a peep at it, it will offer a convenient opportunity for throwing out his chest and telling a gaping audience how wonderfully we moderns have advanced and what poor sticks our colleagues of yore have been, fellows without vision, without critical judgment, without method, so quite unlike modern science with all its profundity and inherent exactitude,—in brief, to him the history of medicine will be a ready means for glorifying the present state of affairs and for belittling the men of the past 'as they well deserve'. And a third will use the history of medicine for launching a powerful speech with a few grains of knowledge and much fantasy, and if he wields a clever pen, he can be as brilliant as he likes: hardly one in ten thousand can control the urge!"

My thesis tonight is that the history of Medicine is also interesting and is well revealed, when it is approached from the neglected angle of the terminology of the past. The words certain men gave birth to are often more interesting than the men themselves. The individuals lived, worked, sinned and died—but the words they coined have lived on and are used by us today.

Take, for example, the familiar word inoculate. Let us imagine ourself a medical student with enough curiosity to look up the derivation of this word in the medical dictionary. All we find is that it comes from the Latin in = in, and oculus = an eye. This is meaningless unless one knows that in the days of Ovid, oculus meant a bud and inoculatio meant a graft. We express the same concept when we speak of the eye of a potato. No wonder the student learns little of the meaning of the words he uses if the medical dictionaries give so little help. As a result few know the origin of our medical terms and eventually the derivation is forgotten. Inoculation or grafting is a beautiful example of how our medical terminology tends to become more and more obscure as time passes. The origin of some of the medical terms we frequently use has been completely lost.

It is well known that Greek medicine reached its highest level under the Alexandrine School in the 3d century B.C. under the leadership of Herophilus in anatomy and Erasistratus in physiology. In the second century B.C. physicians of that discipline began to invade Rome taking their Greek terminology with them. The effect of this vocabulary on our present day terminology has been enormous and it has been said that 75 per cent of present-day medical terms can be traced back to the Greek of Hippocrates or of the following Alexandrine period.

The Greek invaders largely conquered the native Latin medical terms but as is so often the fate of conquerors, they were absorbed and changed in the process. The Greek hemicranion, half the head, became hemicranium in Latin; in France the same process made it demicraine, then migraine, and when it crossed the channel after William the Conqueror, it was anglicized to "the megrims". In Rome, the foreign Greek sounded more learned, just as today an ophthalmologist sounds far superior to an oculist. One can visualize the Greek physicians "putting it over" on the local doctors with a Greek diagnosis of nephritis, but not bothering in anatomy to Hellenize the Latin term ren, the kidney. We still use many Latin words for anatomical structures, but when one considers the names of the diseases of these structures one finds a predominance of Greek roots—the portal vein from the Latin porta, a gate or door; but pylephlebitis from the Greek pyle meaning a gate or door, phlebs, a vein, and -itis, inflammation.

It is interesting to speculate about one group of Latin words which, like an underground movement, resisted the invaders. This group is formed of very old Latin terms ending in -igo, -ago, -ligo or -lago. All of them refer to diseases of man, animals, plants or even metals. Curiously enough, today we meet most

of them in our dermatological terms—prurigo, impetigo, vitiligo, intertrigo and lentigo, a freckle. Why these survived is not known—perhaps they were well-established in the lay vocabulary. In the other branches of medicine, we still use lumbago and vertigo, which, by the way, should be pronounced vertīgo.

Rubigo was one word for rust and was used by Ovid of discoloration or tartar on the teeth. His lines descriptive of a certain lady were translated by Dryden as follows:

Sunk were her eyes, and pale her ghastly hue,
Wan were her lips, and foul with clammy glue—"

A delightful picture of oral hygiene in Rome!

As time passed, many words were changed in form as we have said, but many also changed their meaning and we can get a picture of the advance of medical knowledge from these changes. For example, the Greek term neuron previous to the time of Aristotle meant anything of a fibrous nature and in Athens a cobbler was a neuro-rrhaphos or one who sews with tendons. Aristotle limited the word neuron to the nerves and thus prepared the way for all our present day terms from this root. Today the word neuron has gained an even more limited meaning.

Another amusing example is found in the history of the word astragalus which today is the name of a bone in the foot. It started off in Greek to mean a vertebra, especially in the neck of sheep. How it moved from the neck of sheep to the foot of man is interesting. The Greeks of the Iliad carved their dice from the astragalos of the neck of sheep and so the term came to designate one of a set of dice. The Roman soldiers much later took over the word with this latter meaning but applied it to the heel bone of horses from which they were accustomed to carve their dice—and from this it came into human anatomy. Whichever bone was used the resulting dice must have been very uneven, and to risk much on the rolling of such "bones" might prove expensive.

Changes such as these went on all the time and are, of course, still going on today. Hippocrates used the word arachnoid, like a spider web, as a name for scum on the urine; Galen shifted it to a plexus of nerves or veins and it did not acquire its present application to the membrane over the brain until the middle of the seventeenth century. To translate this word correctly from the original one must know its meaning in the period in which the author wrote.

There was another type of change which also clearly gives us a picture of the status of medical lore in a given period. Take, for example, the word trachea which was an adjective and meant nothing but rough. It is in the feminine to agree with the word arteria with which it was originally combined. In the time of Aristotle it was believed that the arteria contained air, hence their name, air tubes. Aristotle called the arteries smooth—but he considered the windpipe a rough artery. What better could tell us of the state of physiology in that epoch? Similarly, the cornea of the eye used to be the cornea tela or horny web or tissues, but the noun was dropped and the adjective cornea became a noun. The same fate happened recently to the word mater of the fanciful Semitic terms pia mater and dura mater, the tender and the strong mothers or protectors of the brain. Today pia and dura are used as nouns. Dura mater is said to be Stephen of Antioch's translation of the Arabic of Haly Abbas.

Still another example is the word autopsy. According to its derivation it comes from autos, self, and opsis, to look at. A far cry from our use of the word today. Actually in the third century B.C. the term autopsia denoted those observations on a patient made by the physician himself, in contrast to the historia supplied by the patient, probably just as verbosely then as today. Such examples could be multiplied many times, but enough have been given to make the point that the story of individual words sheds considerable light on ancient medicine.

During the era of Rome, medical terminology from there filtered into France and the other continental countries, and later, into England. The Dark Ages had tremendous

effect for the original writings of the fathers of medicine went, so to speak, out of print and were later retranslated from earlier Arabic copies. They were also copied from manuscripts which had been preserved, especially in monasteries. In this process mistakes were often made, or when the translator could not deal with an Arabic word he left it unchanged with the result that we today have such terms as alcohol and alchemy. Al, of course, meant merely 'the', while koh'l meant fine or impalpable. Koh'l was used especially of the fine black powder used on the eyebrows as a cosmetic. Even in the fifteenth century the term alcohol was applied to chemical powders and essences, and only later gained its present implication when the word appeared in the phrase "alcool of wine".

Mistakes in translation are well illustrated by the story of our word for the back of the eye, retina. To this structure Galen had applied the word amphiblestron which unfortunately then had two meanings—a surrounding coat and a fisherman's net. Galen used the word in the first sense but translators into Latin chose the second, and so used the root of the Latin rete, a net for this structure and this error is permanently established in our medical vocabulary. Perhaps some of the words for which we have no derivation or explanation came about in this same fashion. In this group are abdomen, mediastinum, omentum and testicle. There are several suggested derivations for some of these words but none are convincing.

Abdomen was used in the time of Pliny but its origin is lost. Perhaps it is derived from the Latin abdere meaning to hide, hence it might suggest the cavity in which many odds and ends are hidden away. Others believe it comes from the Latin adeps meaning fat.

We are equally in the dark about the word mediastinum which in ancient Latin meant a slave, servant or intermediary; perhaps it was from this last meaning that the name mediastinum was given to this structure intermediate between the two halves of the chest.

There is not even a guess about the origin of omentum whereas there are two theories about the word testis. It has been said to come from testum, a little pot, or from testis meaning a witness—perhaps a witness testifying to manhood.

It is unfortunate when the origin of a term is lost for one can never be sure of the exact sense in which the word was employed in the distant past and may easily be deceived. The Greek word psora meant the itch and was applied to a number of skin conditions. But one would certainly not be justified in assuming that the skin disease we call psoriasis was one of these for the usual chronic psoriasis does not itch.

The more we know of ancient medical terminology, the more accurately we can read the writings of the past and understand their thoughts and reasoning. It is important to realize the power of a translator for good or evil. Several examples—alcohol and retina have been mentioned. There are many others. There is much justification for an interest in and a study of medical terminology.

We have seen how words change their meaning and form, or go out of use and are lost sight of. This applies especially to the distant past, but the same process has always been and is continuing today. One need only go back a single century in medical writings in our own tongue to find that we are faced with words no longer in our current vocabulary. It was in 1825–6 that the famous William Beaumont reported his immortal studies of digestion in Alexis St. Martin, who had an opening into his stomach. This was only a minute ago on the clock of medical history, and yet in his vocabulary we meet the words alvine discharges, muriatic acid and cataplasma. All of these sound a little unfamiliar to us today. Alvine, of course, comes from the Latin alvus, the belly or bowels and its meaning is clear although the word is no longer employed. However, from the closely related Latin word alveus, a cavity or trough, we derive our current terms alveus in the brain, and alveolus in the lung and in dentistry.

Alvine had a short life in English having come into use only about the middle of the eighteenth century and already being obsolete.

Muriatic is a more colorful term than hydrochloric for it takes us back through the sixteen hundreds in French to the Latin muria which meant brine—a natural root for the early chemists to choose when a name was needed for this chlorine-containing substance.

Beaumont applied a poultice to Alexis but he called it by the old term cataplasma. I wish there were time to discuss the origin and the many descendants of this Greek root plasso, I mold. We see it in plasma, an ancient Greek word adopted by physiology about one hundred years ago, in plaster, plastic, plasmodium and cytoplasm, for example. An interesting family history of this word could be written. A cataplasm, of course, was something which was molded down as one would a poultice. What I have said of Beaumont's words could be duplicated in even later periods. To the younger generation, even the terms enteric fever, chlorosis and phthisis already sound unfamiliar.

Another process which is constantly going on is the adoption of words primarily scientific into lay speech. The history of these tells us much about the state of medicine of that era for a word does not enter general use without a good reason. The possible examples of this are legion—we can consider only a few.

About 800 A.D. the Emperor Charlemagne was worried about a question which has plagued rulers before and since; the prevalence of venereal disease. He, as others have done, established governmentally controlled brothels in the vain hope of reducing the incidence of disease. These were popularly called clapiers or rabbit warrens; hence our slang term clap for gonorrhoea. An illuminating story for a moralist to worry over.

Shingles, the popular name for the herpetic eruption which almost encircles the chest, is the corruption of the Latin cingulum, a girdle, and so is the Britisher's name, singlet, for an undershirt.

What is the connection between the tartar on our teeth and tartaric acid? The latter substance is not found in the former—but both derive their names quite unexpectedly from the Greek tartaron or Latin tartarum, which meant the incrustations on the inside of a wine vat which form after fermentation. Tartar on the teeth resembles these incrustations; tartaric acid is found in them.

Our familiar word frenzy opens an interesting page of medical history. Frenzy is an eroded popularization of phrenitis. In turn, phrenitis comes from the Greek phren which was applied to both the diaphragm and the brain. Hence the phrenic nerve and phrenospasm on the one hand, and phrenology and phrenitis on the other. The quaint explanation is that the pit of the stomach was long ago thought to be the seat of the emotions, so the same word came to be used of the diaphragm, and even of the brain, after the seat of the emotions was transferred to that organ.

There is a nice story, probably true, that ammonia was so named because it was first obtained from camel dung at the shrine of Jupiter at Ammon in Libya.

We use the word muscle so often we forget to ask its derivation, and we fail to enjoy its overtones of historical significance. Lost in the past is the story of the first use of the Greek word mus, meaning mouse, to also mean muscle. One can imagine a muscular Greek rippling his biceps and saying "it looks like a mouse running up and down under my skin." Then we find musculus, a little mouse, in Latin and later in French. Today we use the Greek combining form myo-, and also the word muscle taken from the Latin. The latter appeared four hundred years ago—about a century before the Greek root was employed to coin new scientific terms.

Let me mention one more word in this group to drive home the point that medical terminology illustrates the sweep of medical history. The Greeks used the word enteron of

the bowel although it actually meant no more than our term, the innards. They considered the lower end of the bowel the most important and, therefore, termed it the arch-enteron just as we say archduke or archbishop. Somewhere along the line the word enteron was dropped and arch came to be used alone as a noun. This appears in Chaucer as arse, the harsh diphthong ch having been changed to s. Arse came to this land and was thought to be merely the Britisher's broad A pronunciation. Hence our present slang and the sad story of the downfall of the scientific term archenteron to the gutter.

We must not assume that medical terminology sheds light only on ancient medical history, and only through words in use in olden times. This is not true for many interesting facts are revealed if one studies the neologisms or coinages of the past four centuries. It was in the sixteenth century that, after a long interval, the renaissance in science was born. As new facts and knowledge were achieved, new terms were needed and had to be found in classical Greek or Latin or coined from these languages. It was to Greek that recourse was more often had, partly because this tongue with its many prefixes and suffixes lent itself to the building of new words. These new coinages are now mingled with ancient terms in our vocabulary and it is often difficult to tell one from the other.

Any one of these neologisms will obviously tell us that at the time of its origination, medicine had a need for a name for some newly discovered something. It tells us of the state of medical thinking in that era and incidentally often reveals the author's poor knowledge of the classical languages. This, as might be expected, is especially true today, for coinages are going on daily in increasing numbers.

Let us see how the history of the word "endothelium" does all of this. If you should look this up in the medical dictionaries you will find only that it is derived from the Greek endon, within, and thele = the nipple. This is not very illuminating although true. The facts are as follows: Ruysch who lived from 1638 to 1731 observed the layer of cells covering the papillae of the tongue and in coining a name for them chose the Greek epi = upon, and thele = the nipple, which was the closest he could come in Greek to papilla. So came epithelium to be born. A hundred or so years later, similar cells were found within the body by His, and these he named endo-epithelium with the epi omitted. Still later mesothelium was coined.

Today epithelium is becoming a lay word and its interesting origin is unknown to the many who employ it and who would be amazed if they learned that it means only "on the nipple". Ruysch started a family of terms—on, within, the middle of, the nipple, tumors of each of these and so on. This is the sort of story our medical students should know instead of learning the words as a somewhat superior parrot might.

In the early days of the seventeenth century the Dutch chemist van Helmont originated the word "gas". He did not know much about the various gases, and he confused the matter by coining another term "blas" for ferments which were supposed to control the action of each gas. Van Helmont centered the control of gases in the pit of the stomach and one might be tempted to think that he coined the word gas from the Gr. gaster = stomach. However, the fact is that he formed it from the Gr. chaos = confused, for he suspected that a gas was a confused state of primordial matter. This every day word, gas, opens up this picture of the state of medical science about 1600 A.D. On the other hand, the root electro- comes from the Greek name for amber, elektron, because of the phenomena seen when amber was rubbed. So all our electrical terminology will be forever amber.

As has been said, many of the recent coinages would have meant nothing to an ancient Greek or Latin—but what is far worse many of these terms are so badly chosen as to mean of themselves little to us. Richet's coinage, in 1901, of anaphylaxis was certainly unfortunate; because it was chosen to describe a theory which has since been discarded by advancing

science. Antibiotic is an absurdity; thalassemia, a confusing compound; Dujardin's choice of proglottid for the segment of a tapeworm cannot be understood even though he explains that it was "because of their form and their mode of locomotion".

Anyone tempted to coin a neologism should certainly obtain the best advice available, and perhaps there should be a national council on scientific terminology whose approval would have to be obtained before a new term was set free to plague us all for generations. Such a council would be similar to the Council on Pharmacy of the American Medical Association. It would undoubtedly approve cryoglobulin, Cecil Watson's new word for proteins precipitating from cooled serum, and estrogen, a producer of estrus which, in turn, came from the Greek word meaning desire or a gadfly which frenzies you.

Such a council would often have to choose between several new words coined simultaneously by different investigators for the same substance or phenomenon. It frequently happens that several new terms with the same meaning compete for popularity for some years until one wins out and is accepted, and the other is discarded. Take, for example, the simultaneous use of both sicklemia and drepanocythemia; the former a hybrid of sickle and the Greek haima = blood, whereas the other is all Greek being from drepan, a sickle, kytos, a cell, and haima—but the hybrid has won out.

These individual words and their derivations have not been detailed just because each is in itself interesting, but because, it seems that by doing so it is possible to develop the thesis that through a study of medical terminology we can obtain fascinating sidelights on medical history—on epochs, on individuals, and on the growth of scientific knowledge.

Let us consider still another way in which a study of medical terminology brings these results. Let us take one branch of medical science, for example bacteriology, and consider the source of its vocabulary. It is less than three hundred years since bacteria were first seen and just a hundred years since the word bacterium appeared in English. With the development of this science a whole new vocabulary was required and no help was to be found in Hippocrates, Celsus or Galen. So it was from lay sources in Greek and Latin that assistance was obtained. As we study these derivations we can visualize the step by step advance of bacteriology.

Culture is an old Latin word from the countryside. Coccus was a berry, germen meant to sprout, a bacillus was a little rod. All straight from the Roman orchards and farms. Streptowe get from the Greek word meaning twisted—but it came to be applied to jewelry of twisted metal, and so to mean a chain, in which sense it was adopted into bacteriology. Staphyle was nothing but a bunch of grapes. Microbe, however, was coined by Sédillot, a French surgeon of the nineteenth century.

Toxin, of course, comes from the Greek word meaning a bow. Arrow poisons were called toxikon pharmakon, pharmakon meaning drug, but the latter word was eventually omitted and toxikon was latinized as toxicum = a poison. In 1886, the word "toxin" was coined to meet a need in modern scientific terminology. From the same ancestry comes the term toxophily, which is the name given to their sport by addicts of archery.

On the other hand, the analogous Latin word virus meant a slimy liquid, a poison or even an offensive odor or taste. It was adopted into English over 350 years ago and amazing as it seems was used prophetically in 1800 of the virus of smallpox; a very long time before it was discovered that smallpox was caused by one of the agents which have come today, for lack of a better term, to be called a virus. It is interesting to reflect on the long course which brought these two words, one Greek, one Latin, both meaning poison, from their primary use, to their extremely limited significance today. A toxin and a virus both originally poisons, but how very different today.

One could develop this approach much further—monilia = a string of beads, incu-

bate = to lie in, or on, and so related to the male incubus or nightmare which lies on you in contrast to the female succuba which lies under. It is historically interesting that this word incubatio was also in use in ancient times to denote the practice of sleeping in the sanctuaries of Aesculapius in the hope of being cured of disease. No more examples are needed to make it clear that the history of the words gives a better panorama of the development of bacteriology than would a listing of the names of great personages. These have their rewards in the horrible eponyms—salmonella, nocardia, brucella.

Of course, the terminology of each medical specialty will tell the historical story in a different fashion. We have seen how bacteriology turned to simple agricultural sources for many of its words. Dermatology, on the other hand, has many terms which were applied to skin diseases in ancient Greece—but in many instances we are not today sure whether it was to the same disease which is now designated by the word. We have already mentioned the many terms ending in -igo which Dermatology has perpetuated from early Latin. Let us now look at a few from ancient Greek which have changed their meaning. Psoriasis we have discussed but there are many others.

Poikiloderma, from poikilos = variable, was employed in Euripides to describe a piebald skin but today it is used of an atrophic state of the skin. Pityriasis used to be the name of what today is called seborrheic dermatitis, although the word itself means nothing more, by derivation, than a brany or scaly condition. The Greek pemphix, from which we derive the word pemphigus originally meant a pustule, a blister, a breath, blast, drop, cloud or ghost. It is easy to see how confusing this might be unless a translator chose the correct word. It is interesting that it was not until about 1760 that Sauvages applied the term pemphigus to this disease which had previously had many other names.

Tinea in Roman days meant a gnawing worm and was applied to a worm which devoured manuscripts. We find this use reflected in our lay term bookworm; while its application to a skin disease reappears in our term ring-worm. All of us who enjoy medical history are of necessity bookworms.

Perhaps, however, the most colorful word in our dermatological vocabulary is phrynoderma which takes us right back to the fourth century B.C. Phrynoderma means having a skin like a toad, for the Greek phryne or phrynos meant toad. But the famous Phryne who posed for some of the most famous Grecian statues was a very beautiful woman although of low morals. Why she was named toad is not known, but the same name was given to several other notorious members of the oldest profession. Could it have been due to the cosmetics they used, or to their having a syphilitic eruption? The latter is unlikely for we have no good evidence that syphilis existed in Greece at that time. Perhaps the word was a compliment and compared their skin to the smooth white skin of the toad's belly. Perhaps we will never know, but here is another example where a word leads us to ancient history. And you can appreciate that if we are ever to understand the history of certain diseases we must know the history of the words used long ago and now.

Once one gets started thinking about medical words and their meaning, one finds that the matter turns up all the time. You visit your dentist and he tells you he is going to test the pulp of one of your teeth with an electrical vitalometer. At once you explain to him that Cicero limited the use of this word pulpa to the soft flesh of the breasts and buttocks of young maidens, and that for testing the sensitivity of these, it seems to you that there are better and more primitive methods than a vitalometer.

This is a most amusing and instructive hobby: one can play with it in so many ways. For example, one can take a certain concept such as that a disease suddenly attacks the body, and trace this as it appears in medical terminology. We find it at once in the Greek epilepsia from epi, upon, and lepsis, a seizure;

in the Latin impetere, to attack, which is the root of impetigo, a skin disease often developing suddenly; we see it in the French of la grippe, which grips us suddenly. No doubt you can add to this list.

Once you start on this hobby you find new and entertaining derivations every day. In Rome, a tonsilla was a mooring post for boats, standing out from the bank of the Tiber; today a tonsil stands out from the side of our throat and is a happy mooring place for passing streptococci.

The word idiot has an ancient ancestry back to a Greek word meaning an ordinary or lay person, one not holding office—from this it came to mean a simple or uneducated individual and finally one who is feebleminded. Today it almost seems that we are all idiots for not getting on the governmental payroll, but perhaps we soon will be whether we like it or not.

Organic chemistry today is the chemistry of living substances but in the ancient Greek the root word organon meant an instrument or a tool. Aristotle used it to denote mechanical, hence not living. Plato applied it to an organ of sense and by the seventeenth century it was applied to the organs of the body. In this fashion it has had its meaning changed completely about, and in following its history we glimpse several historical epochs. The word vegetable has also travelled a reverse course. On the other hand, nausea has always meant sea sickness, and skeleton came from the word signifying dry and we still speak of dry bones. Time has come for me to stop riding my hobby and I hope I have said enough to convince you that medical history can be approached through the words we use as well as in other ways.

In conclusion, it may be said that the study of medical terminology itself is a delightful and repaying hobby. Every medical teacher should be interested in it, because only if he himself knows the derivations and history of the words he uses in his teaching, can he, when the opportunity offers, transmit some of this to his students. He should remember that his students know little Latin and probably no Greek. He must remember that there is little time in the curriculum for the history of medicine or for its cultural and colorful aspects, both of which are needed to round out the background of our knowledge of medicine. Medical men love their chosen profession—that jealous mistress of their life; they want to learn all they can about her. My thesis in this talk has been that even the very words of medicine are worthy of our study to this end.

Memoir of Daniel Longaker*

By LEWIS C. SCHEFFEY

THE death of Daniel Longaker, in his ninety-first year on April 30, 1949, recalled to the memories of many of us the history of a generation of obstetrics and gynecology in Philadelphia, for Dr. Longaker's professional career spanned a period of sixty-eight years, of which fifty-six were most active ones. Elected a Fellow of the College in 1893, he was active in attendance and interest, especially during those days when a Section on Obstetrics and Gynecology existed in the College.

Of Pennsylvania-German ancestry, he was a Lutheran by birth, having first seen the light of day on September 9, 1858, in the home lived in by five generations of his family. This interesting old residence stood near Iron Bridge, in Limerick Township, Montgomery County, Pennsylvania. His early education was in one-room public schools in Salford and Limerick, and at Washington Hall Collegiate Institute at Trappe, Pennsylvania, long since the site of Ursinus College. Coming to Philadelphia at the age of seventeen, he became an indentured apprentice to an apothecary, in the days when drug stores were really pharmacies, finally receiving the degree of Ph.G. from the Philadelphia College of Pharmacy in 1879. This achievement was but a stepping-stone to medicine, and in 1881 the Medical School of the University of Pennsylvania granted him the M.D. diploma.

Dr. Longaker early developed an interest in obstetrics in addition to general practice, and in 1881 he was appointed Assistant Physician to the Philadelphia Lying-in Charity Hospital, then located at Eleventh and Cherry Streets, and now a part of the Pennsylvania Hospital. In 1887 he became a Visiting Physician. During the same time he was also Attending Physician to the Lying-in Department of the Northern Dispensary, and was later on Consulting Physician to the same institution. From 1886 to 1916, he was Obstetrician to the Jewish Maternity Hospital, then located at Sixth and Spruce Streets.

In 1884, Dr. Longaker was elected a Fellow of the Obstetrical Society of Philadelphia, three years after graduating in medicine. Of interest is the fact that the young graduate became a Fellow at the same meeting that elected Theophilus Parvin, late of Indianapolis, Indiana, upon the latter's acceptance of the Professorship of Obstetrics and Diseases of Women and Children at Jefferson Medical College. Dr. Longaker was a faithful member of, and a spirited attendant at the meetings of the Obstetrical Society, presenting numerous papers, and entering into many discussions. His interest in this group never flagged. In 1938, when the writer of this memoir presented his retiring Presidential Address entitled "The Early Years of the Obstetrical Society of Philadelphia" at the seventy-fifth anniversary meeting of this Society founded in 1868, Dr. Longaker, with other honorary members spoke feelingly and informatively of its earlier days, for he had also served as its President in 1915.

An early association of his was with the Kensington Hospital for Women, founded in 1883, by Dr. Howard A. Kelly, dean of modern American gynecology. He shared the companionship, not only of Dr. Kelly, but of Doctors Charles P. Noble, Hunter Robb, George M. Boyd and William E. Parke. From 1915 to 1931, he was Obstetrician and Gynecologist at Kensington, and later on served there as Consultant Obstetrician. He also occupied a similar post at St. Agnes Hospital.

A local association that Dr. Longaker treasured was membership in the ancient Northern Medical Association of Philadelphia,

* Prepared at the request of the Council of the College of Physicians of Philadelphia.

founded in 1846. Elected in 1881, he was the thirty-seventh President of this venerable organization serving in 1893, the same year as that of his election as a Fellow of this College.

A life member of the Philadelphia County Medical Society, he was an Associate Vice-President in 1916. A member of the American Medical Association, the Medical Society of the State of Pennsylvania, he was likewise a Fellow of the American College of Surgeons, and was one of the first Diplomates of the American Board of Obstetrics and Gynecology.

Dr. Longaker was ever regarded as a progressive practitioner, possessing sound judgment and unusual skill; his honesty and integrity were outstanding. Gracious and courteous in demeanor, his character was beyond reproach. His community interests ranged widely. He enjoyed nature and travel, and many an excursion he made on foot. One of his most enjoyable extra curricular activities was membership in the Pennsylvania-German Folklore Society, the annual meetings of which he always attended.

It is worthy of note that he was an early advocate of Cesarean section. In fact, his first operation of this sort, successful for mother and child, was performed in 1890 in a farm house near Doylestown, Pennsylvania. In connection with this it is well to remember that in Philadelphia, after Prof. Gibson's two successful Cesareans here in 1837, not a single one was performed without mortality until 1888, when Dr. Kelly accomplished one safely, and Dr. Noble did likewise in 1890, the same year that Dr. Longaker enjoyed the success noted above. Approximately 5000 babies were delivered by Dr. Longaker during his long career.

His wife was the former Margaret Pancoast, whom he married on December 18, 1884. She preceded him in death on December 1, 1942. Six children have survived this union. That the medical proclivities of the father have been passed on to his descendants is evidenced by the fact that one son, two grandsons, a son-in-law, and a grandson-in-law are practicing physicians. May they carry forward the grand tradition of this beloved and accomplished Fellow of the College whose memory is dear to family, friends and patients alike.

Memoir of Alfred Hand*

By JOHN P. SCOTT

DR. ALFRED HAND, Professor of Pediatrics in the Graduate School of Medicine, died at his summer home at Montrose, Pa., on September 1, 1949.

Dr. Hand was born at Scranton, Pa., on February 7, 1868. His father was Justice Alfred Hand of the Pennsylvania Supreme Court. After receiving an A.B. degree from Yale in 1888 and a Ph.B. degree in 1889, Dr. Hand entered the Medical School of the University of Pennsylvania and graduated in 1892. He served internships in the Children's Hospital and at the German (now the Lankenau) Hospital. While at the former institution he made the studies on the syndrome of exophthalmos, diabetes insipidus and areas of softening in the skull, now known as the Hand-Schuller-Christian disease.

Following his internship, Dr. Hand entered private practice which he continued until May of this year. He was a member of the staffs of the Children's Hospital, the Mary J. Drexel Home, and the Methodist Episcopal Hospital. He later became pediatrician in chief at each of these institutions. He was also consultant to the Widener Memorial Home. He was a member of the American Pediatric Society, the American Academy of Pediatrics, the College of Physicians of Philadelphia, the Philadelphia Pediatric Society and the Philadelphia County Medical Society.

Dr. Hand was married on June 6, 1899 to Miss Louise Gregg, of Philadelphia, who survives him. He is also survived by four children, Miss Phebe Hand of Philadelphia, Mr. Alfred Hand, Jr., of Chicago, Ill., Dr. John G. Hand, a surgeon of Philadelphia, Mr. Benjamin C. Hand, also of Philadelphia, and three grandchildren.

Dr. Hand was a man of handsome appearance, with a gracious, friendly manner, always ready to give up his personal comfort and pleasure to help a patient or fellow physician. His many friends regret the passing of an important figure in American medicine.

* Prepared at the request of the Council of the College of Physicians of Philadelphia, and read at the meeting of the College, 1 February 1950.

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TRANSACTIONS & STUDIES

of the

College of Physicians of Philadelphia

Volume 18 (Fourth Series)

Number 2 (June 1950)

The Value of Pulmonary Function Tests in the Diagnosis of Pulmonary Disease*

By J. H. COMROE, JR., M.D.

Department of Physiology and Pharmacology, Graduate School of Medicine, University of Pennsylvania

TO CLINICAL, radiologic, bronchoscopic, pathologic and bacteriologic methods of diagnosis, clinical physiologists have recently added functional tests of the lung.

Pulmonary function studies are relatively new and their usefulness and limitations are not yet completely clear. It is clear, however, that current tests of pulmonary function do not necessarily reveal alterations in all types of pulmonary disease; they do so only when pulmonary disease disturbs function, and disturbs it sufficiently that these tests can detect a deviation from normal with certainty.

More than a score of pulmonary function tests are in use in various laboratories. These include measurements of the volumes of air breathed at rest, during activity, during inhalation of carbon dioxide and of oxygen mixtures, and during maximal voluntary hyperventilation. These include also measurements of the various lung volumes (inspiratory capacity, expiratory reserve, vital capacity, residual capacity, functional residual capacity and total capacity), alveolar gas pressures, diffusion constant of the lung, pulmonary vascular pressures and blood flow and pressure of carbon dioxide and oxygen in the arterial blood. A description of these various tests may be found elsewhere (1–3). Only a few of these will be discussed here.

Tests of Distribution of Inspired Air Within the Lung

One aspect of pulmonary function which has long been of interest to the physiologist is now becoming of considerable practical importance to clinicians. This is the factor of "intrapulmonary gas mixing." Essentially the problem is, "How evenly is inspired fresh air distributed among the 700 million alveoli in the lungs?" Uneven distribution can obviously lead to underventilation of some alveoli and overventilation of others and eventually to ventilatory insufficiency. This problem of uneven distribution of *gas* within the lungs is closely related to the evenness of distribution of pulmonary capillary *blood* throughout the lungs. First, however, let us consider the lungs simply as a pair of bellows and see how the factor of distribution of air can be measured.

One important method is that of Darling,

* Thomas Dent Mütter Lecture LXII, College of Physicians of Philadelphia, 1 February 1950.

Studies reported were carried out under a grant from the Commonwealth Fund.

Cournand and Richards (5). The principle of Darling's method is as follows: At the beginning of the test the patient is breathing room air and the lungs are, of course, filled with alveolar air containing approximately 80% nitrogen. When a single breath of oxygen is inspired, this mixes with the lung gas and dilutes it. Upon expiration, some of this diluted gas is expired and some nitrogen is consequently lost from the lung. It is replaced with pure oxygen on the next inspiration. This process is repeated over and over again until eventually the lung nitrogen has been almost completely replaced by oxygen. If the assumption is made that the lung is a perfect mixing chamber and if the volume of the functional residual air (the amount of gas remaining in the lung at the end of a quiet expiration) is known along with the volume of oxygen inhaled into this with each breath, an ideal curve of nitrogen washout can be constructed by mathematical computation. Now if alveolar gas samples are obtained from the patient at various times after beginning the inhalation of oxygen, a curve of nitrogen washout actually found in this patient can be constructed. If the actual curve coincides with the calculated, ideal curve, it is assumed that the lungs of the patient act as a perfect mixing chamber. Deviation from the ideal curve indicates abnormal mixing and the extent of the deviation suggests the extent of the abnormality. This method has a great deal to recommend it, but it is laborious and requires training, skill and patience in the delivery of alveolar gas samples and in the chemical analyses of these samples. Furthermore, multiple tests are required in order to secure all the alveolar samples necessary to construct the curve.

TABLE 1

PER CENT NITROGEN REMAINING IN ALVEOLAR AIR AFTER BREATHING OXYGEN FOR ONE MINUTE (15 BREATHS)

WHEN THE EFFECTIVE TIDAL VOLUME IS	WHEN FUNCTIONAL RESIDUAL CAPACITY IS	
	2500 cc	4500 cc
	%	%
750 cc	1.4	8.8
500 cc	4.7	17.0
250 cc	19.5	38.0

A test more suited to clinical use is that proposed by Cournand, Baldwin, Darling and Richards (4). In this test, the patient simply breathes oxygen for seven minutes; at the end of this time, he delivers an alveolar air sample which is analyzed for nitrogen concentration. If the inspired oxygen is distributed uniformly throughout the lung, it will wash alveolar nitrogen out of *all* parts of the lung uniformly so that at the end of seven minutes, there will be very little nitrogen left. If distribution is nonuniform, and some areas are hypoventilated, these will retain much of their nitrogen until the final forced expiration at the end of seven minutes squeezes it out, and so raises the nitrogen concentration in the expired gas. Cournand has placed the upper limit of normal at 2.5% nitrogen.

This test is not simply a measurement of the distribution of inspired air because it is influenced also by the volume of breathing and the volume of alveolar gas. *Table 1* shows that a normal lung (F.R.C., 2500 cc) receiving a normal tidal volume (500 cc) fifteen times per minute will contain only 4.7% nitrogen after oxygen is inhaled for one minute. If this same lung be hypoventilated (250 cc tidal volume), it will contain 19.5% nitrogen, whereas if it be hyperventilated (750 cc tidal volume), it will contain 1.4% nitrogen. Thus the final concentration varies with the tidal volume even if the distribution is perfect. If the F.R.C. is abnormally high (4500 cc), the nitrogen concentration in the alveolar gas will be high following oxygen inhalation for one minute even if the tidal volume is normal. If this larger lung be hypoventilated, the nitrogen concentration will be considerably higher; if hyperventilated, it will of course be much lower. Since the final alveolar concentration of nitrogen measured by the Cournand test at the end of seven minutes is influenced by the lung volume, effective tidal volume and rate of breathing, as well as by the distribution factor, it is obvious that this test can be falsely positive so far as the

distribution factor is concerned if the F.R.C. is large or ventilation is small[1], or can be falsely negative if the F.R.C. is small or ventilation is large. These factors were all appreciated by Cournand (4). Despite this, he and others have found the test a clinically useful one in the diagnosis of emphysema because in this condition, the F.R.C. is increased, tidal volume may be decreased, and abnormal distribution exists.

We employ a test which requires only a single breath of oxygen and thus eliminates many of the variables in the seven minute test. The single breath test requires special equipment which can record nitrogen concentration continuously and almost instantaneously. This has been made possible by the nitrogen meter devised by Dr. John Lilly (7). This is an electrical gas analyzer which works upon the principle of the familiar neon tube. A vacuum pump continuously sucks a small sample of the respired gases from the mouthpiece into a glass tube where a high voltage is applied to it. This causes the gas to glow with a characteristic color depending upon the gas present. Nitrogen glows with a bright orange-pink color, oxygen with a faint green, and carbon dioxide with a dim blue color. The light characteristic for nitrogen is selected by a color filter and measured by a photoelectric cell. One of the features of Dr. Lilly's meter is that it analyzes and records the amount of nitrogen in the exhaled air within 0.03 second. This makes possible a complete test within a few seconds. The patient is required to do no more than take one breath of oxygen and then blow it out through the mouthpiece.

A diagram of an actual record is shown in *Figure 1*. At the beginning of the record (upper left) the patient is breathing air and the nitrogen meter records 80% nitrogen. Then oxygen is inspired for a single breath (0% nitrogen). If this inspired oxygen mixes rapidly and completely with the alveolar nitrogen, all of the expired gas should have the same nitrogen concentration. In the illustration, after a brief period representing "washout" of the respiratory dead space, the expired gas concentration is uniform (horizontal line) until the end when a forced expiration has squeezed some gas of high nitrogen concentration from poorly ventilated alveoli (which received little of the inspired oxygen).

Fowler, who conceived this single breath technique, has devised a method for measuring quantitatively this expired gas plateau (6). An individual with normal lungs has very little difference in nitrogen concentration between the alveolar gas expired early in expiration and that late in expiration. When distribution is grossly abnormal, there is a considerable increase in nitrogen concentration toward the end of expiration indicating that hypoventilated areas of the lung empty somewhat later

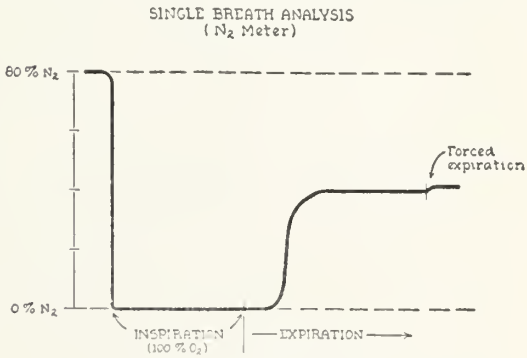

Fig. 1

than the well ventilated (and better oxygenated) areas.

This test has proved to be sensitive and diagnostically useful. In one hundred comparisons with the Cournand test, it has been found to be positive in thirty-two instances in which the seven minute test was normal. Unfortunately, this instrument is expensive, requires trained personnel, and its use is limited to large medical centers.

Clinical Importance of Uneven Distribution of Inspired Gas

Uneven distribution is a factor in a number of pulmonary diseases. *Figure 2* shows schematically some of the disorders which produce it.

[1] The respiration of chronically anoxemic patients is often reduced appreciably by the inhalation of oxygen; this reduces another variable.

1. *Decreased elasticity of certain parts of the lung relative to others.* The left lung in this diagram is normally elastic, and tends to recoil into the expiratory position (as indicated by the arrows). The right lung has lost most of its elasticity. Air will be drawn preferentially into the right lung during inspiration (because the opposing elastic recoil is diminished) but will be expelled during expiration with difficulty and only by active expiratory effort. This is the characteristic defect in emphysema and results in a puffed up, distended lung.

2. *Regional obstruction to air flow.* This leads to increased effort during the entire respiratory cycle and to uneven distribution. The obstruction pictured in *Figure 2* includes all types of bronchial and bronchiolar obstructive lesions, including asthma.

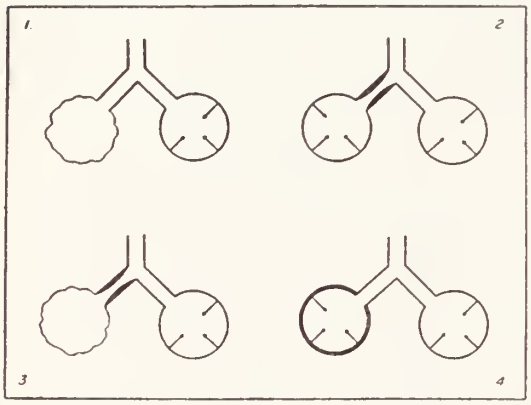

Fig. 2

3. *Combination of obstruction and diminished elasticity.* The obstruction reduces the relative ease of air flow during inspiration that would occur because of diminished elasticity. Upon expiration, air flow becomes unusually difficult because of the combination of obstruction and diminished elastic recoil. This is characteristic of obstructive types of emphysema.

4. *Decreased expansibility of some areas of the lung.* This leads to increased effort particularly during inspiration. Such a change often occurs in patients with fibrosis, congestion, carcinoma, sarcoid, pulmonary hemangioma, abscess or pleural effusions.

Finally, there may be combinations of changes in elasticity, obstruction and expansibility, in the same or different regions of the lungs.

Role of Obstruction in Uneven Distribution

It is apparent that obstruction may play a large role in uneven distribution of the inspired air. It is important to evaluate this factor because it is often amenable to treatment. The maximal breathing capacity test is frequently employed for this purpose. This is measured by requiring the patient to breathe as deeply and as rapidly as he can over a period of fifteen seconds. It differs from vital capacity in that the latter represents the largest volume of gas that can be expired after a single maximal inspiration *without respect to time*, whereas maximal breathing capacity is defined as the maximal volume of gas that can be breathed *per unit time*. Unfortunately, certain technical difficulties limit the usefulness of this test. Thus it depends upon the ability of the patient to understand what is required of him, his willingness to cooperate and the cleverness of his performance. Values obtained vary with the tendency of the patient to cough or choke during the test and with the type of apparatus employed (resistance in breathing valves, weight of spirometer bell, etc.). If all of these difficulties are eliminated or overcome, a reduced capacity indicates no more than the presence of a mechanical limitation to breathing. This may result from reduction in lung volumes. Even if lung volumes are found to be normal, it may result from diminution in pulmonary elasticity, obstruction, reduced expansibility, weakness of the intercostal muscles (poliomyelitis, myasthenia gravis), or diseases of the bony thorax. The maximal breathing capacity test is not an analytical one, because, by itself, it cannot differentiate between these. However, additional information can be obtained if the test is performed before *and after* administration of potent bronchodilator agents, by spray or injection, or both. It is justifiable to attribute any increase in M.B.C. following the drug to relief

of previously existing obstruction since this is the only readily reversible factor apparent.

In all probability the vital capacity test can be made to provide essentially the same information, with less discomfort to the patient, if two measurements are made—one as rapidly as possible (using a rapid kymograph) and the other without respect to time.

Uneven Distribution of Pulmonary Capillary Blood to Alveoli

Just as uneven ventilation of the alveoli is important, so is uneven distribution of the circulation. This uneven circulation may take the form of a complete shunt, such as exists in patients with a pulmonary hemangioma, or with complete atelectasis of an area; in these some venous blood never comes in contact with functioning alveoli. On the other hand, uneven circulation need not be of this absolute type but may be relative, in which poorly ventilated areas have disproportionately large circulation.

In all of these conditions, the arterial oxygen saturation will be decreased because some of the venous blood either is not oxygenated at all or is poorly oxygenated. Anoxemia resulting from an absolute shunt can be differentiated from that caused by poor ventilation by measuring arterial oxygen saturation during inhalation of pure oxygen. The contribution of poorly ventilated areas can be obliterated by oxygen therapy for ten to fifteen minutes, since this provides a high enough oxygen pressure to saturate the blood in all areas where blood comes in contact with alveoli (even though these be poorly ventilated). If oxygen inhalation completely relieves the anoxemia so that arterial blood becomes 100% saturated, the difficulty must have been due to poor ventilation, poor distribution or poor diffusion. If, on the other hand, the anoxemia is not completely relieved, an anatomical venous-arterial shunt must exist. Such a test will not indicate whether the shunt is intracardiac or due to pulmonary hemangioma or complete atelectasis, but will certainly compel further study to detect the precise nature of this shunt.

Correlation of Physiological Tests with Other Diagnostic Tests

Despite the emphasis that I have placed upon these several tests, I would not like you to think that we place complete reliance upon one or even a few tests of pulmonary function. We routinely perform about thirty studies upon each patient with suspected pulmonary disease. Even then the information derived from these may be inadequate in a specific case and we must do additional studies or devise new tests.

By the application of a large number of these physiologic tests to patients with pulmonary disease, we have learned that there is no necessary correlation between information gained from pulmonary function tests and that from other diagnostic techniques. Thus there is no necessary correlation between the function of the lung and radiologic diagnosis. Processes which produce shadows on the x-ray film do not necessarily change function, and those which change function do not always produce characteristic roentgen shadows. Furthermore, there is no necessary correlation between function and pathological changes as seen in autopsy material. Functional tests analyze a dynamic picture occurring during the life of the patient, while pathological studies show only structural alterations that occurred at the time of death or post-mortem. Congestion, edema and atelectasis often occur terminally; this makes it difficult to compare the dead lung with that that had been studied by physiological tests one or two weeks previously. Thoracic surgeons have a better opportunity to compare structure and function by a careful examination of a lobe or lung immediately after surgical removal; they have not yet exploited this opportunity.

Again, there is no necessary correlation between function and dyspnea. One patient who had very severe impairment judged by most physiological tests, complained of no dyspnea even when walking on the treadmill. Conversely, patients occasionally complain of severe dyspnea and yet have relatively little functional impairment; this is particularly true in patients with neurocirculatory asthenia. Fi-

nally, there is no necessary correlation between functional changes and the number of rales heard on physical examination. In a study of patients with pulmonary edema who had widespread rales bilaterally, both anteriorly and posteriorly, arterial oxygen saturation varied from 70% to as much as 98%.

The Usefulness of Function Tests in Differential Diagnosis

Pulmonary function studies can occasionally differentiate between diseases which present somewhat similar clinical pictures. They enable us to distinguish between polycythemia vera, and polycythemia which is secondary to arterial anoxemia. Often this can be accomplished simply by detecting the presence of arterial anoxemia in the resting patient. However, some patients with pulmonary disease have normal arterial oxygen saturation at rest and become anoxemic only during exercise; thus it appears wise to sample the arterial blood during a standard exercise test before ruling out the possibility of secondary polycythemia. As mentioned before, function tests also enable the clinical physiologist to differentiate venous-arterial shunts from disease of the pulmonary parenchyma.

In our experience they have been helpful in making a distinction between cardiac and pulmonary types of dyspnea. Pulmonary function tests have uncovered serious pulmonary disease in patients diagnosed as typical congestive heart failure; in these patients, arterial anoxemia existed which was sufficiently severe to suggest that the congestive heart failure was secondary to pulmonary disease. Multiple factors may contribute to the development of congestive heart failure in patients with pulmonary disease. Organic narrowing of the pulmonary capillary bed, in conjunction with vasoconstriction due to anoxemia, puts a considerable strain upon the right ventricle. The work of both ventricles is usually increased by two other factors: (a) an anoxemic stimulus arising in the chemoreceptors of the carotid and aortic body which increases the rate and force of cardiac contraction, and (b) compensatory polycythemia which, if severe enough, can increase the work of both ventricles. Since the work of the heart is thus increased at a time when the arterial oxygen saturation is reduced, relative coronary insufficiency may ensue. It is important to recognize the factor of anoxemia, for in these cases oxygen therapy must be considered to supplement other therapeutic measures. In several instances, very dramatic relief has resulted from the use of oxygen alone.

The application of physiologic tests to patients with emphysema has provided a clearer concept of this disease. As a result of better diagnostic methods, we know now that this is a very common disease, both by itself and in combination with other pulmonary disorders. We have studied a number of patients in whom emphysema could not be attributed to chronic cough, bronchitis or asthma but appeared to result instead from a single or repeated pulmonary infections such as pneumonia. Since there is no specific or satisfactory treatment for well developed emphysema, preventive measures assume primary importance. All physicians realize the importance of early and effective treatment of asthma, cough and bronchitis as a measure to prevent the development of emphysema; few realize the equal importance of prompt and efficient treatment of all types of pulmonary infection to prevent emphysema.

Once structural damage has developed, pulmonary reserve is decreased markedly. Pulmonary insufficiency may then result from apparently minor aggravations such as mild or moderate pulmonary infections, bronchial obstruction with atelectasis, surgical removal of small amounts of functioning lung tissue and hypoventilation from any cause. As a rule, pulmonary insufficiency from emphysema develops in the age group above fifty because there is a progressive loss of elasticity of the lungs with advancing age.

Early diagnosis of emphysema therefore should be stressed. This can lead to an awareness of the situation so that further structural change might be avoided. With the newer functional tests now at the disposal of the physician, it is not proper to wait until there is

fixity of the chest, hypoventilation, impairment of the elimination of carbon dioxide with a high blood carbon dioxide to make a diagnosis of emphysema; this represents a relatively late stage when the physician can do little more than relieve the element of bronchial obstruction and prevent additional damage caused by infection.

Physiologic tests are of value in determining whether definite impairment of function exists. This is important in compensation cases and in patients with neurocirculatory asthenia or hysteria, who complain of severe dyspnea. The objectivity of some of these tests is such that they do not require cooperation on the part of the patient. Furthermore, the speed of some of these tests is such that these can be used as screening procedures upon large numbers of workers in industries where there is a dust hazard to detect the earliest signs of pulmonary change.

Most of the newer tests of pulmonary function require expensive equipment and trained personnel and for some years to come their use will be limited to large medical centers. Wherever facilities exist, they may be used to establish normality or abnormality of lung function, to measure objectively the extent of alteration, to analyze the cause of this change and to evaluate therapy on an objective basis.

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The Hospital in the Rural Community*

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BENJAMIN MUSSER practiced medicine in the rural village of Strasburg, Lancaster County. In doing so he followed in the footsteps of his father, his grandfather and his great-grandfather. His son, who planned this lectureship, and his grandson who gave the first lecture in the series, both practiced medicine in the city; but both took an active interest in keeping the country doctor abreast of medical progress (1, 2). I am sure that your committee had in mind this tradition of the Musser family when they did me the honor of asking me to speak about rural medicine under the Benjamin Musser Lectureship.

I

If you were to enter the Susquehanna River where it flows through the farm country of the Mussers, and then follow it upstream some 350 miles, you would come to the end of your journey in Otsego County in central New York State. Otsego Lake is the headwater of the Susquehanna. At the south end of the lake in the angle between the shore and the emerging river lies the village of Cooperstown. It was established there in 1787 by William Cooper, father of the author James Fenimore Cooper.

The medical profession got off to a poor start in Cooperstown. In 1791 the town's first physician was convicted of mixing tartar emetic with the beverage at a ball given in the Red Lion Tavern. He was put in the stocks and then banished from the community. After recovering from this undignified performance the village went through the medical vicissitudes common to many isolated farming communities. It had its share of the inevitable quacks who flourished in the country towns of the 19th century, but it also had its share of the admirable type of country doctors. In 1838, when the number of residents was about 1300, the village had four practicing physicians, certainly a generous number for a village of this size (3).

In the second half of the 19th century, Cooperstown became the center of the rich but unstable hop-growing industry. In 1885 more than half of the large American crop of hops was grown within 40 miles of the village (4). The entire local economy and much of the social life depended upon the success or failure of this single crop. Even the medical services were sensitive to the fluctuations in the hop market. In a good period, funds were raised for a small hospital which was opened in 1868. Eight years later, in a period of financial stress, the hospital was closed because of lack of funds. In the late eighteen-eighties, when the prosperity of the community was at its peak, funds were again raised, this time in greater amount, for the construction of the 15-bed "Thanksgiving Hospital" which was opened in 1896. This was at first, quite a progressive little institution. It purchased an x-ray machine in the year 1900 and an ambulance in 1904. In 1906 a new wing raised the bed capacity to 25 (3).

When World War I began in 1914, Cooperstown had hospital facilities which were probably as good as those of other villages of its size, and it had an adequate number of general practitioners. Dr. Mary Imogene Bassett was one of these. Both her father and her mother practiced medicine in Cooperstown before her. In 1887, the year of her graduation from the Woman's Medical College of Pennsylvania she returned to the lovely family home of the Bassetts, there to share offices with her parents. During the period of the first World War, Dr.

* Benjamin Musser Lecture IV, The College of Physicians of Philadelphia, 3 May 1950.

Bassett was the dean of the medical practitioners of the community.

Edward Severin Clark, one of Cooperstown's most generous benefactors, was a patient of Dr. Bassett. It was he who provided the funds for the construction of the hospital which now bears her name. The hospital buildings were completed in haste in 1918 after the Government had accepted Mr. Clark's offer to make them available temporarily for use as a convalescent hospital for Air Corps officers. After the war the hospital was re-equipped for civilian use and was opened to the public in 1922 with Dr. Bassett as its first chief-of-staff.

In its initial period of operation the hospital was a failure. Regardless of the exact cause of the failure, the experience demonstrated that it takes more than attractive and well equipped hospital buildings to raise the level of medical care in a rural community. A 100-bed hospital, if it is used only to hospitalize the patients of the local practitioners, is too large for a village of three thousand inhabitants. Furthermore, the problems involved in the operation of so large a hospital were not well understood by the local people. These problems increased after the death of Dr. Bassett in 1922. Finally, in 1925, there were such irreconcilable differences of opinion regarding professional policies that the Board of Trustees decided to close the hospital (3).

The hospital was reopened in 1927 again with the financial backing of Mr. Clark (5). On this occasion some of the errors of the earlier experience were avoided. Specialists who had had experience in well organized teaching hospitals were brought in to head the major services. The policies and objectives of the new venture were somewhat confused at first but after about two years of uncertainty the direction of the hospital was placed in the hands of Dr. George M. Mackenzie who set the course for the next eighteen years. He served both as Director and Physician-in-Chief until he retired in 1947. Before describing the accomplishments of Dr. Mackenzie's directorate, I shall sketch briefly the present state of the community and the hospital.

II

About the turn of the century it was learned that the hill-sides of California were superior to those of central New York for the production of hops. Within a period of a few years the hop-vines disappeared from the Cooperstown area. At present the most common agricultural unit of Otsego County is the small dairy and poultry farm. Most of the farms are operated by the farmer and his family with occasional hired help. The community was in a bad state of depression in the early and mid-thirties but the farmers have recently gone through a period of relative prosperity.

Cooperstown is the County seat and the shopping center for the farmers and other residents of the area. The village is now in the midst of a mild tourist boom. Those of you who are baseball fans will know one of the reasons for this. Cooperstown is the "birthplace of baseball", the home of baseball's *Hall of Fame*. But even before the relatively recent discovery of the locus of nativity of the national game, the lake in summer, the ski-slopes in winter, and the James Fenimore Cooper landmarks in all seasons, attracted people to the country around Otsego Lake.

Cooperstown is strictly a rural village. Its population in 1940 was just over 2500. It has no manufacturing. It is 25 miles from the nearest railway passenger station. Except in the tourist months of June to September, it is a quiet, peaceful, charming village.

The hospital comprises four separate structures, each built of native field stone with white trim. The in-patient facilities are all located in a long main building. Twin buildings lying behind the two wings of the main building were originally designed for a Nurses' Home and a Laboratory. A building lying behind the center of the main building was intended to serve as an isolation ward. The laboratory building still plays its original role, but the Nurses' Home and isolation ward are used for doctors' offices, waiting area, examining rooms and other out-patient facilities. The new Nurses' Home which is much larger than the

old one is about a block away from the hospital property.

The hospital contains 92 beds and 22 bassinetts. The arrangement of the clinical services and the general activities within the hospital are modeled on those of the larger urban teaching centers. There are separate clinical services for medicine, surgery, pediatrics, gynecology and obstetrics and otolaryngology. Approximately 75% of the patients are ward patients, 20% semi-private, and 5% private.

One will see on the wards the large numbers of personnel usually seen in teaching hospitals. There are graduate nurses, student nurses, medical students, interns and residents. There are teaching rounds, grand rounds, lectures by our own and by visiting doctors, pathological and x-ray conferences, journal clubs, and seminars. There is an impressive medical library which contains thousands of medical and scientific books and subscribes to about 130 periodicals. There is a shamefully crowded medical record room with filing cabinets piled to the ceiling.

There are many strange contrasts between the structural design and utilities of 1918 and the diagnostic and therapeutic equipment of 1949–50. The hospital laboratory can be reached only by walking across an open areaway where in winter the temperature may be 20° below zero and the path may be bordered by snow thrown up shoulder high. The old elevator which creeps along at a snail's pace is an infuriating vehicle. But for the present it is all we have to carry food, patients, visitors, refuse, linen and all the other things which have to move vertically in a hospital. In contrast to this ancient machine, we have the most modern surgical equipment, deep x-ray therapy apparatus, flame photometer, ballistocardiograph, refrigerated centrifuge, and Geiger counter.

The medical staff of the hospital is composed of two senior general surgeons, three senior and one assistant internist, one senior and two assistant pediatricians, one senior obstetrician and gynecologist, one otolaryngologist, one radiologist, one pathologist, one medical anesthetist and two research fellows. The house staff will be described later. In addition to the medical staff there is a very complete nursing staff, administrative personnel, librarian, record librarian, dietitians, technicians, housekeepers, engineers and others.

The total number of hospital employees is approximately 230. Although they do not all live in the village, their number is equal to about 10% of the village population. If one adds to the employees the members of their families, the total group dependent upon the hospital comes to about 1000. Quite apart from its activities in the field of health the hospital is by far the largest business enterprise in the community. Its payments in salaries and wages and its purchases in the local markets are elements of vast importance in the local economy.

The hospital affects the lives of almost everyone in the community. The babies are born in its delivery room. They return at intervals for check-ups and immunization in the pediatric clinic. The pediatric staff, acting as school physician, provide preventive medical services for the 850 pupils of the central school and all the schools in the area. Physical defects are listed in all pupils every year and positive action is taken to have the defects corrected. Members of our medical staff act as village health officer, jail physician and physician to the old people in the County Home. If anyone in the community is sick he may call directly the member of the hospital staff who has cared for him previously and is familiar with his particular case. But if his doctor is away on vacation or if he has no favorite doctor, or if he is a stranger in town, he may call the hospital and ask to have a doctor sent out to see him. The hospital ambulance, accompanied by a hospital intern, responds to all emergency calls and on many a bad winter night has had to go out to a distant farm to bring in a woman who has run into trouble in the course of a pregnancy.

III

We may now look back to see how the hospital attained its present position. From an early date those who guided its development

had in mind the establishment in a rural community of "a general hospital with the motivations and the atmosphere of the better university hospitals" (7). Here was an opportunity to deal experimentally with the vexing problem of quality in the distribution of modern medical care to rural areas. Mackenzie stated in 1942 that the policy had been largely determined by the following concepts: "1. Careful planning and constant efforts to maintain conditions of work which will promote professional growth. 2. Replacement of extreme professional individualism by collective enterprise. 3. Elimination, as complete as possible, of the private enterprise quality and the private profit motivations of the doctor-patient relationship. 4. Provision of funds and of opportunities for clinical investigation and research in the medical sciences. 5. An appreciation of the social significance of disease" (7).

The hospital was organized along the lines of what would now be called a group practice institution. All of the doctors of the community were invited to join the staff on a full time salaried basis and all with one exception did so. Those who joined moved their offices into the hospital. From that time on the hospital through its staff was responsible for medical care in Cooperstown and its immediate surroundings, in the homes of the patients as well as in the hospital. In addition to serving the local community, the specialist staff and the fine equipment of the hospital attracted more and more patients from adjoining areas. The vast majority of these patients came upon referral by their local physicians either for diagnostic studies or for surgical operations or other special treatment. In all such cases a full report of findings and recommendations went back to the referring doctor.

It would be stretching a point to say that the virtues of this new type of rural hospital were immediately apparent to all concerned. Country people are traditionally conservative and many of them were doubtless suspicious of young city doctors with new-fangled ideas. When they came in to see the doctor they didn't want to be examined from top to toe. Nor did they want to have a lot of mysterious tests. They wanted to get their medicine and get back to work.

One of the great accomplishments of the hospital has been its gradual success in educating the local people in matters of health. An example of early and easily won success was that in the field of obstetrical care. As early as 1935, when 65% of the babies born elsewhere in Otsego County were born at home, only 2 out of 114 babies born in Cooperstown were born outside the hospital, i.e. less than 2% (8).

There are other numerical evidences of a change in the attitude of the people toward the hospital. One such piece of evidence is shown in a graph of Annual Admissions and Patient-Days for the years 1928–1949. The annual patient days have increased from an average of about 16,000 in the early years to about 28,000 in recent years. The total annual admissions have increased to a much greater extent than the patient days: from approximately 1,100 to over 3,100. The increase is still quite impressive even if one leaves out the newborn admissions which have increased four-fold since 1940. All of the lines in the graph show a dip during the period of World War II when part of the hospital had to be closed for lack of staff. It obviously would not have been possible to take care of so many more admissions in the same number of beds if improved methods of treatment had not shortened the average length of hospital stay from 15.4 days in 1932 to 8.9 days in 1948.

In 1942 Mackenzie estimated that there were "annually from 12,000 to 20,000 home calls, out-patient visits and office consultations" (7). Out-patient statistics were not kept until 3 years ago. In 1947 there were 23,919 office calls and domiciliary visits; in 1949 this figure had increased to 28,239.

Table I, showing the number of deaths and autopsies, reflects in its last column a steady improvement in the community's appreciation of the hospital's objectives. The autopsy record of the hospital has always been good but the average of 69.1% in recent years compares

favorably with that of the better urban hospitals. The figure for 1949 was 73.5%.

The surgical experience of the hospital has also given evidence of success in the education of the public. In the early years patients were very hesitant about submitting to elective operations. For example, most of the numerous individuals in the community who had hernias refused operative treatment unless some serious complication made an operation inescapable. Powers' recent study (9) shows that in the period 1933–39 there were at the Mary Imogene Bassett Hospital only ten to twenty hernioplasties each year. In 1940 the number of elective hernioplasties began to increase and in the year 1948 there were 70. In 1949 there were more than 100.

TABLE I

DEATHS AND AUTOPSIES

3-Year Periods

YEARS	ADMISSIONS*	DEATHS*		AUTOPSIES*	
		No.	% of Adm.	No.	% of Deaths
(1927–28)†	1923	113	5.87	51	45.1
1929–31	3453	185	5.36	85	45.9
1932–34	3427	174	5.07	88	50.5
1935–37	5037	238	4.73	125	52.5
1938–40	6261	339	5.41	206	60.7
1941–43	6789	302	4.45	186	61.6
1944–46	7001	294	4.20	183	62.3
1947–49	9388	259	2.76	179	69.1

* Including newborn.

† 20 months only, from opening of hospital on March 22, 1927 through December 31, 1928.

The distance factor is generally considered to be one of the greatest obstacles to good surgical care in rural areas. Only one-fifth of the hospital's patients live in Cooperstown and the surrounding township. More than one-third of the patients come from beyond the limits of Otsego County. Many of the patients, including not a few obstetrical cases, live 20 to 30 miles from the hospital. The adverse effect of these formidable distances may be neutralized to a considerable degree by education of the public and by close liaison between general practitioner and hospital staff. Evidence of this may be noted in a recent study by Darling and McIver (10) of the treatment of acute appendicitis at the Mary Imogene Basset Hospital. The study indicates that the delay between onset of symptoms and entry into the hospital is now no greater in this hospital than it is in urban hospitals, although 303 of the 540 patients in the study lived more than ten miles from Cooperstown.

The intimate contact of the hospital's staff with the facts of rural health has served to expose, if not always to remedy, the medical needs of the community. Occasionally, it has been possible to take some direct action to meet an obvious need, as was done when the hospital provided both space and supervision for a new County Public Health Laboratory. In other instances progress has been made by publicizing and inviting discussion of the problems encountered. The major event of this type was the "Conference on Rural Medicine" which was held in Cooperstown in 1938 under the auspices of the hospital (8). The factual data for discussion at the conference were provided in part by a series of reports on the first ten years experience of the Mary Imogene Bassett Hospital.

One of the greatest problems in rural areas is that of keeping the quality of medical care from deteriorating. We have all heard repeatedly in recent years the questions: How can you get well trained young doctors to go into the rural communities? How can you keep them there after they have settled? How can they be kept abreast of medical advances and taught new methods? The experience at Cooperstown has pointed a way toward a solution of some of these problems. It was realized in the beginning that the hospital could not attain its objectives unless it could attract and hold a professional staff of high quality. Its success in these regards has been attributed by Dr. Mackenzie to: (1) the adoption of the principle of group practice, (2) the internal program of education designed to promote the continuing professional growth of the staff. The fine medical library and the unusually large and well

equipped laboratory have been essential to this program.

As a natural consequence of its program of internal education and its stimulating intellectual atmosphere, the hospital attracted to its staff those who had an interest in medical education. This led, in turn, to expansion of the teaching activities in the hospital. The postgraduate training of interns and residents was started at an early period and as the hospital grew the size of the house staff and the program of education were both expanded. There are now 8 interns and 6 residents. Last year there were nearly one hundred applications for six vacancies in the intern staff. The applications came from all parts of the United States, from Canada, from Mexico, and from Central and South America. There are also many applications for residencies. The hospital is accredited by the specialty boards for residency and fellowship training in Medicine and Surgery.

In 1936 informal instruction of undergraduate medical students was begun. This was continued for the next ten years chiefly during the summer months. Most of the students came from the College of Physicians and Surgeons, Columbia University. They were enthusiastic about their work in the country and it became increasingly apparent that the rural hospital could provide a type of experience which was not otherwise available in the medical curriculum. The success of this experiment in undergraduate teaching finally led to the conclusion in 1947 of a formal affiliation between the hospital and the College of Physicians and Surgeons. Senior medical students are now assigned to us throughout the year for periods of two months each. There are usually 3 to 5 students in each group. They live in the hospital, wear white clothes and serve as junior interns. The ties with Columbia University have recently been further strengthened by a regular exchange of assistant residents between the Bassett Hospital and the Presbyterian Hospital of New York. I believe that such exchanges can be increased to the benefit of the staff of both institutions.

The most recent development in the field of education has been brought about by a tripartite affiliation between the Bassett Hospital, The Columbia-Presbyterian Medical Center, and Hartwick College of Oneonta, New York. Under this affiliation which became effective in 1949, the hospital provides basic clinical instruction and experience for the students of the Hartwick School of Nursing.

IV

The difficulty which most people experience in meeting large hospital bills is magnified in the case of the farmer by his relatively small cash income. In recognition of this serious obstacle to the distribution of good medical care in rural areas the hospital's *Annual Payment Plan* was started on an experimental basis in 1930. The detailed operation of the plan was described by Mackenzie, Murray and McIver in 1932 (11). Subscribers to the plan paid in advance an annual premium of $25 for a single individual or $100 for a family of four or more. Full coverage was provided for hospitalization, and for all doctors' fees whether for service rendered in the hospital, the doctor's office or the patient's home. Preventive medicine, surgical operations, and specialist care were included. Only obstetrical care was excluded.

In commenting on this early experiment in the field of prepaid medical service, Mackenzie stated that "during the nine years the *Annual Payment Plan* was in operation, it seemed to be successful from every point of view. That the subscribers were satisfied was shown by the high percentages of re-enrollments; and the hospital found it a convenient and financially satisfactory method of providing medical care for low income groups. In spite of the success of this undertaking as a social and economic experiment, the New York Department of Social Welfare, backing at that time the establishment of a Blue Cross Plan in the area served by the hospital, urged discontinuance of the *Annual Payment Plan*. Reluctantly the plan was terminated in February 1940" (6).

The *Annual Payment Plan* certainly succeeded in making available good medical care at low cost to the individual. But the measure

of the financial soundness of the plan was not a very precise one. The plan was satisfactory to the hospital because more money came in from premiums than would have been collected if the hospital had submitted bills at the regular rates for the services rendered. Since the hospital's rates in those years produced enough income to pay only about half of the total operating expenses, it would appear that the subscribers to the *Annual Payment Plan* actually paid only about half of the cost of the care which they received.

The hospital's operating deficit has always been a large one. The annual deficit averaged more than 50% of the annual operating expense through the year 1946. In 1948 it was 30.0% and in 1949 it was 27.5% of operating expense. In the early years the deficit was met by Mr. Edward S. Clark, and later by the Clark and Scriven Foundations. In 1947 these two foundations turned over to the hospital funds for a permanent endowment. The income from endowment has been used chiefly to keep down the rates for ward patients. In 1947 the ward rate was still as low as $3.60 per day and the semi-private rate $6.00 per day.

In the Utica Blue Cross area, the Mary Imogene Bassett Hospital is one of twenty-two member hospitals varying in size from 23 to 179 beds. None of the other hospitals offers intern or residency training and none is engaged in teaching medical students. Some of the smaller hospitals provide very incomplete service and in some the expenditures for x-ray service, laboratory service and medical records are negligible. *Table II* presents a summary of cost analysis data of the twenty-two hospitals for the year 1948. Although the total cost per

TABLE II

Analysis of In-Patient Expenses Calendar Year—1948

	Cost per patient day			
	M.I. Bassett Hospital	21 Other Area Hospitals		
		Weighted Average	Maximum	Minimum
Administration	$ 1.03	$ 0.81	$ 1.23	$ 0.45
General House & Property	0.78	0.77	1.14	0.44
Heat, Light, Power & Water	0.59	0.38	0.98	0.10
Laundry	0.40	0.41	1.09	0.25
Housekeeping	0.81	0.66	0.98	0.41
Dietary	0.96	0.74	1.07	0.25
Raw Food	1.78	1.70	2.27	0.84
Nursing (Incl. Nursing School)	4.69	3.70	5.87	1.37
Medical & Surgical Supplies	0.94	0.59	0.94	0.22
Laboratory	1.05	0.32	0.66	0.12
X-ray	0.42	0.37	0.64	0
Pharmacy	0.69	0.76	1.08	0.56
Medical Record Room	0.20	0.11	0.21	0.02
Motor Vehicles (Ambulance, etc.)	0.15	0	0	0
Corporate (Insurance, etc.)	0.53	0.18	0.36	0.04
Depreciation	0.40	0.42	0.69	0.31
Less—Out-Patient Overhead	0	−0.10	−0.21	−0.01
Total Cost per Patient Day	$15.42	$11.82	$15.38	$8.03

The data summarized in this table were collected for the Hospital Plan, Inc. (Blue Cross) of Utica, New York, under the direction of Ganey and Hall, Certified Public Accountants. All 22 hospitals in the Utica Blue Cross area were included in the cost analysis survey. Since the M. I. Bassett Hospital is the only one in the area which maintains a large medical library and employs a house staff, the cost of the library—$0.21 per patient day—and the salaries of the house staff were disallowed in calculating the per diem cost.

patient day was higher in the Mary Imogene Bassett Hospital than in the others, the difference could be largely accounted for by the incomplete services in some of the hospitals and by special factors such as the low nursing costs in the largest hospital in the group—a Catholic Hospital in which the Sisters provide a considerable portion of the nursing care. The figures clearly indicate that the cost of operation of the Bassett Hospital in 1948 was not excessive when compared with that of other hospitals in the area. The detailed figures for the 1949 Blue Cross analysis are not yet available but I have been reliably informed that the weighted average cost per patient day was $14.15 while that at the Bassett Hospital was $16.72.

Table III provides a condensed view of the present methods of financing medical costs at the Bassett Hospital. The figures include all money collected for physicians' and surgeons' fees and for hospital charges including all x-ray, laboratory and other fees; for in-patient care, out-patient care and care in the home.

The basic ward rate is now $7.00 per day, the semi-private rate $8.00 per day, and the private rooms $10.00 to $14.00 per day. There are all-inclusive rates for obstetrical care, $139.00 for ward cases and $210.00 for semi-private cases, including all obstetrical fees, nine days in hospital, and ante- and post-partum care. There are also inclusive rates for surgical operations: the ward rate for a major operation is $160.00 including six days in hospital. The patients like the inclusive rates. They can see beforehand what their costs are going to be and they can budget accordingly.

All patients *without exception* are billed at ward rates or higher for all services which they receive. The record of collections therefore provides a reliable index of the ability of the community to meet the hospital's charges. In recent years approximately 92% of the amount billed has been collected within 12 months of the close of the billing period. It is estimated that the hospital will eventually collect 94% to 95% on these bills since a number of pa-

TABLE III

MARY IMOGENE BASSETT HOSPITAL SOURCES OF OPERATING INCOME—1949

Blue Cross & Blue Shield			
Utica Hospital Plan	$24,084.15		
Utica Blue Shield	13,855.31		
Other Blue Cross	9,401.05	$47,340.51	9.84%
Other Health Insurance—Including Workmen's Compensation Payments to Hospital		17,090.99	3.55%
County Welfare			
Otsego County	24,090.05		
Other Counties	7,112.05	31,202.10	6.49%
State and Local Government—(Including School Health Service)		3,899.47	0.81%
Federal Government (Chiefly Vet. Adm.)		2,725.13	0.57%
Special Funds			
County Tuberculosis Association	657.00		
Poliomyelitis Foundation	2,323.10		
Thanksgiving Home	1,295.18		
Private Philanthropy	716.51		
Miscellaneous	431.50	5,423.29	1.13%
Individual Patients		373,382.83	77.59%
Total		$481,065.32	99.98%

tients pay their bills in small installments over a period of three or four years.

V

It was my belief that you would prefer to have me devote the full time of this lecture to describing the development and present status of the Mary Imogene Bassett Hospital. There is now no time for generalization. In the experience at Cooperstown some of the problems of rural medical care have been solved in at least one locality. One might reasonably doubt the general applicability of the specific method employed to solve each problem. However, I think there would be general agreement that a way has been found to operate in an isolated rural community a small general hospital with high standards of patient care and with a type of internal educational program which attracts young doctors with the highest qualifications.

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Transactions of the Sections

SECTION ON GENERAL MEDICINE

23 January 1950

The Clinical Use of Streptokinase and Streptodornase. William S. Tillett*, M.D. (*Abstract 1, below*)

27 February 1950

Nitrogen Mustard Therapy in Neoplastic Diseases. Lawrence H. Beizer, M.D., and Paul T. Makler*, M.D. (Discussion opened by Lowell A. Erf*, M.D.) (*Abstract 2, below*)

Gustatory Hyperhidrosis of the Left Knee. Sherman M. Mellinkoff*, M.D., and June Mellinkoff*, R. N. (Discussion opened by Bernard J. Alpers, M.D.) (*Abstract 3, below*)

The Trigger Point Syndrome, with a Consideration of Possible Involvement of the Glomus Body-organ of Non-tumor Formation and of Unknown Etiology. Philip R. Trommer*, M.D. (Discussion opened by Louis Kaplan, M.D.) (*Abstract 4, below*)

Radioactive Iodine Tracer Study in the Diagnosis of Thyroid Diseases. Norman G. Schneeberg*, M.D., William H. Perloff, M.D., William Serber*, M.D., Theodore E. Sopp*, B.S., and Leonard Stanton*, A.B. (Discussion opened by Richard H. Chamberlain*, M.D.) (*Abstract 5, below*)

27 March 1950

The Apparent Adverse Effect of Dorsolumbar Sympathectomy on Peptic Ulcer. Francis A. Harkins*, M.D., and John H. Willard, M.D. (Discussion opened by Harold A. Zintel, M.D.) (*Abstract 6, below*)

The Intravenous Use of Quinidine Lactate. A. Henry Clagett, Jr.*, M.D. (Discussion opened by Samuel Bellet, M.D.) (*Abstract 7, below*)

Panhypopituitarism. Karl E. Paschkis, M.D., and Joseph J. Rupp*, M.D. (Discussion opened by Francis D. W. Lukens, M.D.) (*Abstract 8, below*)

Protein Metabolism in Chronic Illness: Effect of Protein Supplementation on Nitrogen Balance, Hemoglobin, Serum Proteins and Weight in the Malnourished and the Effect of the Nutritional Status on Nitrogen Storage. S. O. Waife*, M.D., Michael G. Wohl, M.D., and John G. Reinhold*, Ph.D. (Discussion opened by I. S. Ravdin, M.D.) (*Abstract 9, below*)

24 April 1950[1]

The Symptomatology and Pathogenesis of Coronary Artery Disease: a Study of 950 Patients, including Necropsy Records. Wallace M. Yater*, M.D.

22 May 1950

Gastrointestinal Allergy: Report of Case Resembling Regional Ileitis. George I. Blumstein, M.D., and Julian Johnson, M.D. (Discussion opened by Henry J. Tumen, M.D.)

The Sedimentation Rate in Anxiety States. Samuel J. Goldberg, M.D., and David H. Goodman, M.D. (Discussion opened by Edward Rose, M.D.)

The Use of Hog's Duodenum in the Treatment of Peptic Ulcer. C. Wilmer Wirts, M.D., and M. H. Friedman*, Ph.D. (Discussion opened by Thomas E. Machella, M.D.)

Periodic Arthralgia in 5 Generations of a Family. Angelo P. Angelides*, M.D., and Hobart A. Reimann, M.D. (Discussion opened by Joseph L. Hollander, M.D.)

SECTION ON MEDICAL HISTORY

13 January 1950

Medical History in Medical Words. O. H. Perry Pepper, M.D. (Kate Hurd Mead Class

* *By invitation.*

[1] Joint Meeting with the Philadelphia Heart Association.

of 1888 Lecture (I) in Medical History, The Woman's Medical College of Pennsylvania, printed in these *Transactions & Studies*, April, 1950.)

13 February 1950

THE PATHOLOGY OF GENIUS. Walter R. Bett*, M.R.C.S., L.R.C.P. (Kate Hurd Mead Class of 1888 Lecture (II) in Medical History, The Woman's Medical College of Pennsylvania.)

14 April 1950

WOMEN IN AMERICAN MEDICINE. Richard Harrison Shryock*, PH.D. (Kate Hurd Mead Class of 1888 Lecture (III) in Medical History, The Woman's Medical College of Pennsylvania.)

SECTION ON OPHTHALMOLOGY[2]

19 January 1950

PRESENT STATUS OF RETROLENTAL FIBROPLASIA. V. Everett Kinsey*, M.D.

16 February 1950

BOOKS FOR THE BLIND. Burton Chance, M.D.

INTRACTABLE POST-OPERATIVE DIPLOPIA. G. L. Tabor, Jr.*, Commander, MC, USN. (Discussion opened by William E. Krewson, 3d, M.D.)

THE SURGICAL PRINCIPLES IN CONCOMITANT CONVERGENT STRABISMUS. Glen G. Gibson, M.D. (Discussion opened by William E. Krewson, 3d, M.D.)

16 March 1950

PATHOLOGY OF RETROLENTAL FIBROPLASIA. Algernon B. Reese*, M.D. (Discussion opened by John S. McGavic, M.D.)

SPHENOIDAL FISSURE—OPTIC CANAL, "S.-O." SYNDROME. I. S. Tassman, M.D.

20 April 1950

HUMAN INFECTION WITH NEWCASTLE VIRUS OF FOWLS. Arthur H. Keeney*, M.D., and Matthew C. Hunter*, M.D. (Discussion opened by Wilfred E. Fry, M.D.)

ACCOMMODATIVE CONVERGENCE. Edwin F. Tait, M.D. (Discussion opened by William E. Krewson, 3d, M.D.)

OCULAR MANIFESTATIONS OF ONE HUNDRED CONSECUTIVE CASES OF MULTIPLE SCLEROSIS. Joseph C. Yaskin, M.D., Edmund B. Spaeth, M.D., and Robert J. Vernland*, M.D.

SECTION ON OTOLARYNGOLOGY[3]

18 January 1950

REPORT ON THE FOURTH INTERNATIONAL CONGRESS OF OTOLARYNGOLOGY, JULY, 1949. Gabriel Tucker, M.D. (Discussion by Harry P. Schenck, M.D.)

SWIMMING AND UPPER RESPIRATORY DISEASE. William J. Hitschler, M.D.

WHERE DOES DRAMAMINE ACT? CORRECTION OF FORCED CIRCLING MOVEMENTS BY DRAMAMINE. Maurice Schiff*, Lt., MC, USN. (Discussion by Ernest Spiegel, M.D.)

15 February 1950

SURGERY OF THE NASAL SEPTUM. Louis K. Elfman, M.D.

AURAL VERTIGO. Richard A. Adelizzi, M.D.

COROLLATION OF THE VARIOUS PRESSURE UNITS USED IN OTOLARYNGOLOGY. Oscar V. Batson, M.D.

15 March 1950[4]

MUCOCELES AND RELATED LESIONS OF THE PARANASAL SINUSES. Austin T. Smith, M.D. (Discussion by Joseph D. Kelly, M.D.)

THE IMPORTANCE OF THE RH FACTOR IN HEREDITARY DEAFNESS: A PRELIMINARY REPORT. Joseph Sataloff*, M.D. (Discussion by Franz Altmann, M.D.)

[2] The presentations at this Section are customarily abstracted in the *American Journal of Ophthalmology* and the *Archives of Ophthalmology*.

[3] The presentations at this Section are customarily abstracted in the *Archives of Otolaryngology*.

The April meeting was cancelled.

[4] Annual joint meeting with the Section on Otolaryngology of the New York Academy of Medicine, this year's meeting being held at the College. The discussers are members of the New York group.

Antihistamines in Colds. Harry P. Schenck, M.D. (Discussion by Samuel F. Kelley, M.D.)

SECTION ON PUBLIC HEALTH, PREVENTIVE AND INDUSTRIAL MEDICINE

24 February 1950

Panel Discussion on Report of the Pennsylvania Public Health Survey. Pascal F. Lucchesi, M.D., *moderator*. Discussers: Clyde Arbegast*, Louisa J. Eskridge*, Ruth H. Weaver, M.D., and W. Benson Harer*, M.D.

10 May 1950

Tuberculosis among Nurses. David A. Cooper, M.D.

The Role of Immunization in the Control of Tuberculosis. Joseph D. Aronson, M.D.

Abstracts

Abstract 1

The Clinical Use of Streptokinase and Streptodornase. William S. Tillett, M.D.

The streptococcal enzymes called streptokinase and streptodornase have the capacity to liquefy rapidly the elements of exudates that are chiefly responsible for their purulent thick inspissated character, namely fibrin and desoxyribose nucleoprotein. Since the streptococcal concentrates containing the two enzyme systems can be introduced into patients without serious untoward side reactions, they have been extensively employed in the treatment, by local injection, of diverse types of diseases where the presence of fibrin (massive extravascular hemorrhage) or pus were undesirable features of the illnesses from which the patients suffered.

Although the most desirable methods of utilizing this enzymatic therapy under all conditions are still in the developmental stage, definitive and effective results have been obtained in a large number of patients, including hemothorax and empyema as well as diseases of comparable pathology involving other tissues and sites throughout the body.

The rationale and methods of practical usage, including contraindications and inapplicability together with detailed clinical results, form the substance of this report.

Abstract 2

Nitrogen Mustard Therapy in Neoplastic Disease. Lawrence H. Beizer, M.D., and Paul T. Makler, M.D.

The result of administration of 50 courses of nitrogen mustard to 41 patients with a variety of conditions is reported. The chief toxic effects noted were nausea and vomiting and leukopenia. Nausea alone occurred with 8% of the courses given, nausea and vomiting with 34%. The use of various measures in an attempt to avoid these symptoms was without result, but heavy sedation with barbiturates made them more tolerable. Leukopenia occurred after 16% of the courses of nitrogen mustard, but with the use of antibiotics, no instances of intercurrent infection were encountered.

Beneficial results were inconstant in their occurrence and were obtained in a significant number of cases only in the lymphoma group. In this group, the frequency and duration of the response were greatest in the histologically least malignant cases and least in the reticulum cell and Hodgkin's sarcoma cases. Remissions lasted from two weeks to over 16 months. Symptomatic improvement consisted of increase in appetite, strength and weight, and a feeling of well being. Objectively, there was disappearance of fever, decrease in size of masses, disappearance of skin nodules and pruritis, reduction in size of pulmonary infiltrations and resorption of pleural effusion.

In malignancies, other than the lymphoma group, worthwhile improvement resulted in five cases of pulmonary or chest wall involvement, two of which were metastatic. The response varied with the case and was in each instance symptomatic, including decrease in hemoptysis, relief of chest wall pain, reduction in sever-

ity of cough and increase in appetite and strength.

The response to nitrogen mustard is similar to that obtained with x-ray therapy. In most instances, it occurs more promptly, but is of shorter duration. In an occasional instance, either of these therapeutic measures will be effective where the other has failed. In the lymphoma group, if systemic involvement is apparent, nitrogen mustard therapy should be employed first, to be followed by x-ray therapy. For localized lymphomatous lesions, x-ray therapy is more satisfactory. In other malignancies, symptomatic relief may occasionally be obtained. The use of nitrogen mustard is justified when other measures have failed.

Abstract 3

Gustatory Hyperhidrosis of the Left Knee. Sherman M. Mellinkoff, M.D., and June Mellinkoff, R.N.

An eight months old female infant, shortly after beginning to crawl, developed a syndrome characterized by profuse sweating over the left knee when, and only when, she was given her milk (by bottle, as had been customary). There were no abnormalities whatsoever between bottles. Other foods did not elicit the sweating. When the child began to walk the sweating disappeared. It is postulated that crawling traumatized the cholinergic nerves in the skin over the knee, thus rendering the sweat glands or the nerves supplying them hypersensitive to acetylcholine. Then with sucking, acetylcholine was liberated into the blood stream in increased amounts, carried throughout the body, and provocative of excessive sweating only in the hypersensitive region. Similar syndromes have been described in the cervico-facial region in association with necrotizing lesions around the parotid gland, neck, and face. In this case it is interesting that apparently the sucking of milk was a much more powerful vagal stimulant than were other types of food or other liquids given by bottle.

Abstract 4

The Trigger Point Syndrome, with a Consideration of Possible Involvement of the Glomus Body-organ of Non-tumor Formation and of Unknown Etiology. Philip R. Trommer, M.D.

A series of cases were presented with signs and symptoms resembling varying syndromes. Pain was the most outstanding symptom, and in several cases surgery was suggested for relief. Included were cases resembling a ruptured vertebral disc, sciatica, Horton's Cephalalgia and/or hypertensive encephalopathy, gout of a knee, an old fracture of the ankle and an occlusive peripheral vascular disease problem. Relief in each of these cases was afforded by the use of procaine to block the hyperesthetic areas—the so called trigger points which were in the main located intracutaneously. The technique of eliciting these trigger points and the method of injection was described. The possible relationship of the glomus body-organ of Masson-Popoff with its sympathetic innervation was discussed as a possible etiologic factor. Comparison was made on a medical basis with surgical causalgia, now described as reflex sympathetic dystrophy. It was suggested that the latter concept be considered from both a medical and surgical etiology.

The cases presented were afforded satisfactory relief by intracutaneous block with one per cent procaine and obviated medical procedures which heretofore were unsuccessful, and surgical procedures which would evidently have been unsatisfactory.

Abstract 5

Radioactive Iodine Tracer Study in the Diagnosis of Thyroid Diseases. Norman G. Schneeberg, M.D., William H. Perloff, M.D., William Serber, M.D., Theodore E. Sopp, B.S., and Leonard Stanton, A.B.

A test depending upon the uptake of radioactive iodine by the thyroid gland was evaluated for routine use in the diagnosis of thyroid disorders. A single measurement twenty-four hours (after a 100 micro-curie tracer dose) was found to be satisfactory. The normal range was established between 10 and 34 percent of the ingested dose. Fifteen (13 percent) of 115 euthyroid subjects were below, and 12 (10 percent) above the normal limits. Twenty-five

thyrotoxic patients uniformly concentrated 35 percent or more, whereas of 20 hypothyroid patients, 18 retained less than 10 percent, and 2 concentrated 10 and 12 percent respectively.

The radioiodine tracer test was more than twice as accurate in diagnosing euthyroid patients as was the B. M. R., and was equal in recognizing hyperthyroidism and hypothyroidism. Using the accumulated data, the percent of subjects expected to fall within certain limits was determined: 95 percent of hyperthyroid patients would be expected to concentrate 35 percent or more, whereas 5 percent would be found within the normal range. Seventy-nine percent of euthyroid patients should appear within normal limits with 13 percent below and 8 percent above. Ninety-seven percent of hypothyroid patients should concentrate less than 10 percent with 3 percent appearing within the normal range.

Abstract 6

THE APPARENT ADVERSE EFFECT OF DORSOLUMBAR SYMPATHECTOMY IN THE PEPTIC ULCER PATIENT. Francis A. Harkins, M.D., and John H. Willard, M.D.

Recent reports of the beneficial effects of vagotomy on peptic ulcer have focused attention on the autonomic nervous system in peptic ulcer disease. The question of possible unfavorable effects of dorsolumbar sympathectomy in ulcer patients has received little attention in spite of the frequency with which such operations are done for hypertension. A review of the literature reveals several reports of severe complications of peptic ulcer occurring after sympathectomy but without the usual symptoms of the ulcer or its complications. Mason and Pollard reviewed 1,498 patients having supradiaphragmatic sympathectomies and found 13 cases of peptic ulcer, 11 of which had postoperative complications with 2 fatalities. These authors estimated that 2 and one-half per cent of their series of cases had a preoperative history of peptic ulcer and that of this group 20 per cent had recurrences following sympathectomy.

A case is reported showing the importance of careful follow-up after sympathectomy in any patient giving a history of peptic ulcer. M. E., a 42 year old white female had a dorsolumbar sympathectomy in February 1947. There was a preceding history of gross gastrointestinal bleeding in June 1946 after which an x-ray revealed an irritable and deformed duodenal cap. At the time of operation the x-ray studies were essentially negative except for a questionable incisura at the base of the cap. The blood pressure was 230/120. Following operation there was a period of immediate abdominal distention and nausea which subsided after several days and she was quite comfortable for the next three months. The blood pressure remained within normal limits. In May 1947 she was readmitted to the hospital because of persistent nausea and abdominal distress occurring mainly at night which had failed to respond to rather strict dietary management. X-rays at this time demonstrated a deformed duodenal cap with a definite ulcer crater. Fractional gastric analysis showed only slight hyperacidity. The patient was followed carefully and kept upon a strict ulcer program for the next ten months. Serial x-ray studies demonstrated the persistence of the ulcer crater until March 1948 when it could no longer be visualized. Cap deformity and irritability persisted until the Spring of 1949, two years after operation. Since that time there have been no persistent symptoms and x-ray in July 1949 showed only slight cap deformity and no irritability.

The interest in this case was the development of a large ulcer crater shortly after sympathectomy in the absence of any typical ulcer symptoms and the refractoriness to treatment for a period of two years. It is suggested that caution be exercised in subjecting a patient with ulcer symptoms or a previous diagnosis of peptic ulcer to dorsolumbar sympathectomy and that if operation is done under these circumstances that the patient be followed carefully by x-ray.

Abstract 7

THE INTRAVENOUS USE OF QUINIDINE LACTATE. A Henry Clagett, Jr., M.D.

Quinidine lactate, a soluble, stabile, and phar-

macologically effective salt is suitable for intravenous use. Ten cc. of a solution containing 0.6 Gm. quinidine lactate should be added to 50 cc. of 5 per cent glucose and the mixture allowed to enter a vein at a rate not exceeding 2 cc. per minute. Under constant observation, its administration can be discontinued immediately when indicated, either by the return of regular sinus rhythm or the onset of toxic symptoms.

In the 13 patients treated, the dose varied from 0.4 Gm. to 3.25 Gm. The smallest dose given to a patient with paroxysmal ventricular tachycardia, which was followed by regular sinus rhythm, was 0.8 Gm. Three patients became nauseated and vomited during administration, but there were no other signs or symptoms suggesting toxicity in the series of over 30 intravenous doses given the other 8 patients. Asystole, convulsions, cyanosis, shock, impaired vision, and unconsciousness were not encountered in this series of patients.

Given in the above manner, quinidine is relatively safe and its use may be lifesaving in patients with ventricular tachycardia following myocardial infarction in whom regular sinus rhythm cannot be reestablished by oral quinidine, or whose condition is so critical as to demand the greatest possible speed of action.

Abstract 8

PANHYPOPITUITARISM. Karl E. Paschkis, M.D., and Joseph J. Rupp, M.D.

Two cases of panhypopituitarism are presented because of certain interesting features.

A woman, aged 42, had a severe postpartum shock 12 years ago, followed by amenorrhoea, loss of body hair, weakness and hypoglycemic attacks. Evidence of thyrotrophic, gonadotrophic and adrenocorticotrophic deficiency are presented. She showed dramatic clinical improvement following treatment with testosterone propionate, given for its protein anabolic action. Bedridden for 12 years, she can now do all her housework and has gained 18 lb, in spite of only moderate improvement of the metabolic deficiencies. Interestingly there was no virilization following prolonged treatment with testosterone.

Panhypopituitarism not caused by tumor, is exceedingly rare in men. A man aged 57 had metabolic findings identical with those of case 1. No etiological factor for destruction of the pituitary could be elicited. He improved during treatment with testosterone propionate. After $3\frac{1}{2}$ weeks of treatment studies were repeated. During a Cutler test he developed "Addisonian" crisis. Immediate response to therapy was satisfactory; but from there on he rapidly declined and died. In the last week he exhibited hypocalcemia and tetany, for which we found no explanation. Autopsy revealed extensive, though not complete fibrosis of the anterior pituitary, cause unknown.

Abstract 9

PROTEIN METABOLISM IN CHRONIC ILLNESS: EFFECT OF PROTEIN SUPPLEMENTATION ON NITROGEN BALANCE, HEMOGLOBIN, SERUM PROTEINS AND WEIGHT IN THE MALNOURISHED AND THE EFFECT OF THE NUTRITIONAL STATUS ON NITROGEN STORAGE. S. O. Waife, M.D., Michael G. Wohl, M.D. and John G. Reinhold, PH.D., with the technical assistance of George Clough.

Twelve chronically ill, "protein depleted" subjects were studied by nitrogen balance methods for an average of fifty days (range 22 to 124 days).

On a diet adequate in calories and with the protein intake supplemented by an oral casein concentrate preparation, large amounts of nitrogen were stored. This avidity for protein reached huge proportions in certain individuals even after months of presumably adequate protein intake. Thus an elderly woman with rheumatoid arthritis stored over 6 grams of nitrogen a day for 4 months.

In six subjects, the nitrogen balance rose to approximately the same extent as did the nitrogen intake. This group is said to be very depleted and in the anabolic phase of their reaction to disease. Four other patients studied showed only a moderately increased nitrogen

balance in response to an increased intake of protein. This was probably because their protein stores were more nearly replenished. Clinically, this group is indistinguishable from the former except that (among diabetics) they require significantly less insulin.

No over-all correlation was found between the *amount* of nitrogen stored or the *rate* at which it was stored on one hand and serum, albumin, globulin or weight changes on the other. None of the usual determinants helped in predicting who would store large or small amounts of nitrogen or which protein fraction would change. Prolonged positive nitrogen balance can be maintained in chronically ill patients without significant alterations in serum protein levels or gain in weight.

Patients in the anabolic phase of protein metabolism gained more weight, when compared to those believed to be near complete protein repletion. This latter group had a more marked rise in hemoglobin.

Protein metabolism in chronic illness differs significantly from that in acute illness in previously well subjects. A protein repletion curve will be presented.

Memoir of Henry D. Jump*

By R. MAX GOEPP[1]

Dr. Henry Draper Jump was born October 17, 1867, in Dover, Delaware, the son of Robert Broadaway Jump and Elizabeth Draper.

He was graduated from the Medical School of the University of Pennsylvania in 1893 and served his interneship in the hospital of that institution, later pursuing postgraduate medical studies at the Johns Hopkins University. Before settling down to his life's work he went abroad and worked under Kraus in Berlin and under Adolf Schmidt in Dresden. Returning to America he settled in Philadelphia, where his life was spent with the exception of the last few years, after he had removed to Seaside Park, N. J.

From 1895 to 1905 he served as Attending Physician and Instructor in Medicine in the Outpatient Department of the University of Pennsylvania under Dr. Howard Fussell, and as Consulting Physician to Philadelphia General and Misericordia Hospitals. During most of this time he was also Attending Physician on the staff of the Point Pleasant Hospital, Point Pleasant, N. J.

He was a member of Alpha Tau Omega and Nu Sigma Nu. His interest in civic and religious affairs led him to serve for many years on the Board of the Child Health Society, and he was a vestryman in Holy Trinity Church, Philadelphia.

His contribution to World War I consisted in entering the Service as Recruiting Officer, in the course of which his duties took him to almost every state in the Union.

He was a member of the American Medical Association and constituent societies; was elected President of the Philadelphia County Medical Society in 1917 and in addition served for many years on the Board of Censors of that society. In 1920 he was President of the State Society.

Dr. Jump was elected a Fellow of the College of Physicians in 1902, becoming a Non-Resident Fellow when he removed to Seaside Park, N. J. in 1940.

In 1895 Dr. Jump married Mary R. Irwin, who died in 1940. He had no children. He educated two nephews and a stepdaughter, Roberta H. Kirk. In 1947 he married Martha H. Brown, who survives him.

Although Dr. Jump and myself were practically contemporaries—I was a few months the older—my first association with him was as my teacher in medical ward class, my first introduction to clinical work in direct contact with the patient. In this type of teaching Dr. Jump was particularly successful and always held the full interest of his students. The contributions he made to medical literature during these years and throughout his busy life were numerous and in the form of clinical papers and reports of cases. His special interest in endocrinology suggested his contribution on that subject in "Endocrinology and Metabolism" by Barker, Hoskins and Mosenthal, 1922, in which he contributed to the chapter on the suprarenal glands.

But my principal association with Dr. Jump came many years later on the faculty of the Woman's Medical College of Pennsylvania where he was appointed Professor of Applied Therapeutics and Clinical Medicine in 1923 and held that position until his retirement as Emeritus in 1939. Throughout his association with the Woman's College he took an active part in the administrative as much as in the didactic work of the College, giving generously of his time and outstanding administrative talents to the School in various ways: as Acting Chairman of the Faculty, 1924 to 1925; Chairman of the Department of Pharmacology and Applied Therapeutics; as Acting Dean, 1935 to 1936.

Dr. Jump, at the time a resident of Seaside Park, N. J., died in Philadelphia General Hospital on November 7, 1949.

* Prepared and published at the request of the Council of the College of Physicians of Philadelphia.

[1] Died 18 May 1950.

Memoir of Arthur Parker Hitchens*

By RAYMOND A. KELSER[1] AND STUART MUDD

Lt. Col. Arthur Parker Hitchens, USA (Ret.), died on December 10, 1949, at his home, 906 S. 48th St., Philadelphia, Pa. He was 72 years of age.

Colonel Hitchens was born at Delmar, Del., September 14, 1877, and was graduated from the Medico-Chirurgical College of Philadelphia, Pa., in 1898. In 1901, he accepted a position as bacteriologist with the Mulford Biological Laboratories, several years later becoming director of the laboratories, which position he held until 1918 when he resigned to enter the Medical Corps of the United States Army for service in World War I. Following the war he was commissioned a Major in the Medical Corps of the Regular Army and was promoted to the grade of Lieutenant Colonel in 1937. He was retired for statutory age in September 1941 but immediately placed on active duty on which he remained until February 1945.

Colonel Hitchens served several tours of duty as an instructor in the Department of Preventive Medicine and Clinical Pathology at the Army Medical School. In 1925 he went to the Philippines as a member of the Army Medical Department Research Board. Soon after his arrival in the Philippines, he was designated technical advisor to Governor General Wood on public health matters. He subsequently served in a similar capacity with Governor General Stimson. While in the Philippines, he also served as Professorial Lecturer on Epidemiology, School of Hygiene and Public Health, University of the Philippines and was also President of the Leprosy Research Board. During the period 1928–1933, Colonel Hitchens was Officer in Charge of the Corps Area Laboratory, Fort Sheridan, Ill. In 1938 he was assigned as Assistant Professor of Military Science and Tactics at the University of Pennsylvania. In 1939 he was made Professor of Public Health and Preventive Medicine at the University of Pennsylvania, serving in that capacity until 1944. Following his final relief from active duty with the Army, Colonel Hitchens became City Health Commissioner for Wilmington, Delaware, which position he held until 1947. His last position was that of Director of the Bureau of Laboratories of the Pennsylvania State Board of Health.

Colonel Hitchens' connections with activities in scientific organizations were many. His relation to them was characterized by unusual initiative along constructive lines. He was a member of the College of Physicians of Philadelphia, American College of Physicians, American Public Health Association, Society of American Bacteriologists, American Association of Immunologists, Union of American Biological Societies, and a fellow of the American Medical Association. He was founder and editor of *Abstracts of Bacteriology* and was a member of the editorial board and strong supporter of *Biological Abstracts*. He was a joint author of Bergey's "Manual of Determinative Bacteriology," developed the monograph on "Diagnostic Procedures and Reagents" of the American Public Health Association. He contributed to the growth of the Society of American Bacteriologists and its publication, the *Journal of Bacteriology*. He contributed original scientific articles in the fields of bacteriology, immunology and public health. In public health administration he was a crusader.

Colonel Hitchens is survived by his widow, Mrs. Ethel B. Hitchens; a son, John, of Washington, D.C.; and a daughter, Ethel.

Funeral services were held on Tuesday, December 13th, at the Church of The Saviour, Philadelphia, Pa., with interment in the Churchyard of St. James the Less.

* Prepared and published at the request of the Council of the College of Physicians of Philadelphia.

[1] By invitation of Dr. Mudd.

Memoir of Augustus Adolph Eshner*

By MYER SOLIS-COHEN

Augustus Adolph Eshner, son of James and Jane (Pleschner) Eshner, was born in Memphis, Tennessee, on November 17, 1862, and was educated in the Central High School of Philadelphia. He was graduated with highest honors from the Jefferson Medical College in 1888 and interned at the Philadelphia Hospital, where he spent eighteen of the happiest months of his life. After two years of graduate study in Vienna and Berlin he became associated with his *alma mater* as instructor in clinical medicine and assistant demonstrator of anatomy and as chief clinical assistant in the medical outpatient department of its hospital. In 1891 he was made instructor in clinical medicine in the Philadelphia Polyclinic and College for Graduates in Medicine, promoted two years later to adjunct professor of medicine and in another two years advanced to professor of clinical medicine, a position he held for 23 years. At the Philadelphia Hospital he was registrar of the neurological department for five years and visiting physician for 19 years. As assistant physician to the Philadelphia Orthopedic Hospital and Infirmary for Nervous Diseases he was closely associated with S. Weir Mitchell, for whom he had the deepest affection, and with John Kearsley Mitchell. He also served as physician to the Hospital for Diseases of the Lungs in Chestnut Hill and was consulting physician to the Mercy Hospital.

Dr. Eshner was the editor of a compilation entitled "Fevers" and with Solomon Solis-Cohen wrote "The Essentials of Diagnosis" and with James C. Wilson edited "An American Text-Book of Applied Therapeutics." He translated a number of foreign text-books and contributed many articles to encyclopediae and medical journals.

He was assistant editor of the *Medical News* and of the *Philadelphia Medical Journal*, associate editor of the *Pennsylvania Medical Journal*, and editor of the *Transactions of the Philadelphia County Medical Society* and of the Philadelphia General Hospital *Reports*.

He had been a Fellow of the College of Physicians since 1893, a Fellow of the American College of Physicians and a member of many medical societies, at one time serving as Chairman of the Board of Directors of the Philadelphia County Medical Society.

During World War I Dr. Eshner was a first lieutenant in the Army and served on the cardio-vascular and tuberculosis board at Fort Niagara and at Gettysburg.

Outside of medicine he had many interests, being a member of numerous societies devoted to history, art and the natural sciences. He was quite civic minded and charitably inclined and donated liberally to the College. He also was active in business and during the last fourteen years of his life was treasurer and helped in the management of the Sanknitary Textile Mills, of which his wife is president.

In 1904 Dr. Eshner married Julia Friedberger who survives him. They had two daughters, Mrs. Annette E. Dalsimer and Dr. Juliet E. Nathanson.

Prominent characteristics of Dr. Eshner, who died December 20, 1949, were his erudition, the purity of his diction in speech and writings, his kind, gentle and soft-spoken manner with ward as well as private patients and the consideration and courtesy shown his associates and subordinates.

*Prepared and published at the request of the Council of the College of Physicians of Philadelphia.

Memoir of John Claxton Gittings*

By JOSEPH STOKES, Jr.

Dr. John Claxton Gittings, Professor of Pediatrics in the School of Medicine, University of Pennsylvania, from 1924 to 1939 with the exception of three years of temporary retirement was born in Williamsport, Pennsylvania on May 23, 1874 and died March 8, 1950 in Philadelphia.

For the School of Medicine Dr. Gittings' outstanding accomplishments were three closely related steps which greatly increased the School's academic stature.

The first was the development of a separate Department of Pediatrics which, with the aid chiefly of the Department of Medicine, became one of the major steps towards recognition of the early years of life and of the family unit in the entire field of preventive medicine and public health.

Second, he played the major role in developing graduate education in pediatrics. He organized the Pediatric Department of the Graduate School of Medicine and served for a time as Vice-Dean for Pediatrics in this School.

His third step was the affiliation of the undergraduate school with the Children's Hospital, whereby the Head of the Department of Pediatrics became the Physician-in-Chief of that Hospital. This he was able to accomplish almost single-handed against an extraordinary number of difficult obstacles. At about the same time and through his efforts, a close reaching affiliation was also established for the Graduate School of Medicine with the Children's Hospital. These accomplishments formed the basis for a major part of the later developments in this field at the University of Pennsylvania.

His academic career began in 1904 at the School of Medicine and throughout his rise to leadership in the Department of Pediatrics, his primary interests lay in teaching and administrative organization. His success in both of these was phenomenally good, particularly in his ward rounds with students.

In his ability to envision the organizational requirements of a Department, he took particular interest in the development of clinical and laboratory research despite the fact that his own training did not permit him to utilize personally the technical skills for laboratory research, nor did he have the time for extensive clinical investigation. His encouragement of the younger men in these fields was of fundamental importance in the Department's development.

Recognition of his clinical achievements went far beyond the University of Pennsylvania. He was admitted to the American Pediatric Society in 1910, was its Vice-President in 1916, and its President in 1928. He served for many years as editor of the *American Journal of Diseases of Children*. In July, 1916, he entered the United States Army as First Lieutenant and was honorably discharged as Lieutenant Colonel in June 1918 having served at Plattsburg, Fort Ethan Allen and Lakewood. He was a co-author of two excellent pediatric texts—"Artificial Feeding of Infants" and "Tuberculosis in Infancy and Childhood"—in which fields particularly lay his clinical interests and skills.

He had an extraordinary capacity for friendship which showed itself not only through his relations with his colleagues, but by the deep devotion expressed by his patients and their parents. Those friends he had and "their adoption tried" he grappled to his "soul with hoops of steel".

By means of these friendships both within and without the academic walls which he widened and strengthened, and with the broad base of national and international pediatrics to which he contributed so much, he assisted in laying the foundations upon which we, his confreres and cultural descendants, now build. To him, pediatrics in the broadest sense will always owe a deep debt of affectionate gratitude.

* Prepared and printed at the request of the Council of the College of Physicians of Philadelphia.

Catalogue of the Mütter Museum of the College of Physicians of Philadelphia*

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Van Harlingen, A. (A 209), XVII: 29, 35
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Ward, Charles H. (A 33), XV: 77
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Werner, M. B. (A 147), XVI: 140; XVII: 25
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Wilson, J. C. (A 169), XVI: 145
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Catalogue of Oil Portraits in the College of Physicians of Philadelphia

1950

Subject	*Artist*	*Donor*	*PA No.*
*Agnew, D. Hayes (1818–1892) *Surgeon, anatomist; president of the College, 1889–1891*	Bernard Uhle	Members of medical profession	7
*Allen, Harrison (1840–1897) *Philadelphia anatomist; dissected, described the Siamese twins (specimens in the Mütter Museum)*	Margaretta Archambault	Unknown	86
Anatomy, Lesson in	Unknown, after Rembrandt	Mary Small Mary Mitchell	68
*Ashurst, A. P. C. (1876–1932) *Surgeon, active many years in the affairs of the College; son of the following*	Erwin F. Faber	Phila. Academy of Surgery	103
*Ashhurst, John (1839–1900)	John Lambert, Jr.	Fellows of the College	12
——— *Surgeon; president of the College, 1898–1900*	Adolph Borie	Children of the Subject	55
*Atlee, John L. (1799–1885) *Lancaster, Pa. practitioner surgeon, obstetrician; brother of the following*	Unknown	Walter F. Atlee	43
*Atlee, Washington L. (1808–1878)	Jacob Eichholtz	Family of the subject	41
——— *Lancaster-Philadelphia; with his brother (above), revived the operation of ovariotomy*	Unknown	Mrs. G. W. Conover	92
Barton, John Rhea (1795–1871)	Adele von Helmbold, after Giordani	Mrs. E. S. Willing	66
——— *Philadelphia surgeon*	Unknown	Hampton L. Carson	100
*Burr, Charles W. (1861–1944) *Neuro-psychiatrist; for many years active in the affairs of the College*	Daniel Garber	Friends of the subject	102
Cadwalader, Thomas (1707–1779) *Philadelphia physician*	Unknown, after Charles Willson Peale	Unknown	70
*Caldwell, Charles (1772–1853) *Louisville physician, author, medical educator, educated in Philadelphia*	Thomas Sully	Unknown	49
*Carson, John (1752–1794) *Co-founder of the College*	Rembrandt Peale	Joseph L. Wilson	111

* Fellow of the College.

Subject	*Artist*	*Donor*	*PA No.*
*Chapman, Nathaniel (1780–1853) *Medical teacher, practitioner, journalist; first president of the American Medical Association*	Thomas Sully	Mrs. Henry C. Chapman	40
*Chovet, Abraham (1704–1790) *Anatomist, physician, surgeon; only foreign-born co-founder of the College*	Unknown	Mrs. L. C. Hay	56
*Cohen, J. da S. Solis (1838–1927) *Pioneer laryngologist*	W. T. Thompson	The College's Section on Otolaryngology	104
Cooper, Thomas (1759–1839) *Physician, chemist, politician, teacher*	Charles Willson Peale	Unknown	67
Cullen, William (1712–1790) *Famous Edinburgh physician, teacher of many Americans*	Unknown	Mrs. Mifflin Wistar	48
Cuvier, G. L. C. F. D. (1769–1832) *French comparative anatomist*	Rembrandt Peale	Unknown	35
*Da Costa, Jacob M. (1833–1900) *Physician and teacher; president of the College, 1884–85, 1895–97*	R. W. Vonnoh	Fellows of the College	10
Dewees, William P. (1768–1841) *Philadelphia obstetrician*	John Naegle	I. Minis Hays	50
*Duffield, Benjamin (1753–1799) *Co-founder of the College*	Unknown	John Neill	58
*Duhring, Louis A. (1845–1913) *Dermatologist; great benefactor of the library*	Hugh H. Breckenridge	Fellows of the College	60
*Emlen, Samuel (1789–1828) *One-time secretary of the College*	Thomas Sully	John Emlen	112
*Foulke, John (1757–1796) *Co-founder of the College*	Ida Waugh, after ?	Julia P. Foulke	6
*Friebis, George (1848–1912) *Ophthalmologist*	W. C. Hafner	Family of the subject	93
Gay-Lussac, J. L. (1778–1850) *French chemist and physicist*	Rembrandt Peale	Unknown	37
*Gerhard, William W. (1809–1872) *Noted for several important contributions to medicine*	Robert Hinckley	Family of the subject	63
Gibson, William (1788–1868) *Surgeon of Baltimore and Philadelphia*	Jo(seph?) Wood	Granddaughter of the subject	54

* Fellow of the College.

Subject	*Artist*	*Donor*	*PA No.*
*GLENTWORTH, GEORGE (1735–1792) *Co-founder of the College; father of the following*	Albert Rosenthal, after Charles Willson Peale	Henry R. Glentworth Marguerite L. Glentworth	117
*GLENTWORTH, PLUNKET F. (1769–1833) *Son of the above*	Gilbert Stuart	Marguerite L. Glentworth	116
*GODDARD, PAUL B. (1811–1866) *Anatomist, editor*	Unknown	Mrs. Louisa B. Goddard	52
*GOODELL, WILLIAM (1829–1894) *Pioneer gynecologist*	Alexander Scott, after R. W. Vonnoh	Family of the subject	81
*GROSS, SAMUEL D. (1805–1884) *Surgeon, author; father of the following*	Unknown	Maria Dalbert Gross	72
*GROSS, SAMUEL W. (1837–1889) *Surgeon, son of the above*	F. Y. Heberton	Unknown	74
*HARE, HOBART AMORY (1862–1931) *Practitioner, teacher, author; president of the College, 1925–1927*	Mary Amory Hare [Hutchinson]	The artist	23
HARE, ROBERT (1781–1858) *Pioneer American chemist*	John Naegle	Charles H. Hutchinson	82
*HARLAN, GEORGE C. (1835–1909) *Ophthalmologist, naturalist*	W. P. Gilchrist, Jr.	Mrs. Henry P. Mitchell	57
*HARTE, RICHARD H. (1855–1925) *Surgeon, president of the College, 1916–18*	Leopold Seyffert	Family of the subject	1
*HARTSHORNE, JOSEPH (1779–1850) *Surgeon*	G. W. Pettit	Edward Hartshorne	76
HARVEY, WILLIAM (1578–1657) *English discoverer of the circulation of the blood*	Anna Lea Merritt, after Janssen (van Keulin)	S. Weir Mitchell	36
——— (*See also* "Nonauthenticated Subjects", *at end*)	Erwin F. Faber, after ?	The artist	96
*HAYS, ISAAC (1796–1879) *Ophthalmologist, editor*	Ida Waugh	Henrietta M. Hays	64
*HENRY, FREDERICK P. (1844–1919) *Teacher, author; Hon. Lib., 1890–1919*	Lazar Raditz	Family of the subject	51
*HEWSON, THOMAS TICKELL (1773–1848) *Comparative anatomist; president of the College, 1835–1847*	Thomas Sully	William Hewson	107

* Fellow of the College.

Subject	*Artist*	*Donor*	*PA No.*
*HOLMES, OLIVER WENDELL (1809–1894) *Associate fellow, 1892*	Sarah W. Whitman	S. Weir Mitchell	38
HUMBOLDT, ALEXANDER VON (1769–1859) *German naturalist*	Charles Willson Peale	Unknown	47
*HUNT, WILLIAM (1825–1896) *Surgeon, writer; curator and benefactor of the Mütter Museum*	Louis Hasselbusch	Unknown	62
*HUNTER, CHARLES T. (1843–1888) *Surgeon*	Henry R. Rittenberg	Mrs. Elizabeth R. Moulton	91
HUNTER, JOHN (1728–1793) *Outstanding English surgeon, teacher, writer*	Leslie, after Reynolds	Alfred Stillé	33
———	Leslie, after Reynolds	Alfred Stillé	80
*HUTCHINSON, JAMES (1752–1793) *First secretary of the College*	Unknown	Pemberton S. Hutchinson	22
*HUTCHINSON, JAMES H. (1834–1889) *Practitioner, writer, editor*	Unknown	Friends of the subject	25
*JACKSON, SAMUEL (1787–1872) *Teacher, sanitarian*	Daniel Huntington	Mrs. M. M. Jackson	65
*JAMES, THOMAS C. (1766–1835) *Obstetrician; president of the College, 1835*	Ida Waugh, after (Joseph?) Wood	George B. Wood	16
*JANNEY, BENJAMIN S. (1790–1859) *Practitioner*	Unknown	Mrs. Gertrude Bolles	95
JENNER, EDWARD (1749–1823) *English physician who introduced preventive inoculation*	Unknown	Mrs. Louisa Webb, *est.*	101
*KEEN, WILLIAM W. (1837–1932) *Surgeon; president of the College, 1900–1901*	James L. Wood	Fellows of the College	75
———	R. W. Vonnoh	Children of the subject	29
*KIRKBRIDE, THOMAS S. (1809–1885) *Alienist*	Howard R. Butler	Family of the subject	78
*KRUMBHAAR, EDWARD B. (1882–) *Pathologist, historian; president of the College, 1940–42*	Daniel Garber	Mrs. E. B. Krumbhaar	114
*KUHN, ADAM (1741–1817) *Co-founder, and president of the College, 1808–1818*	Louis Hasselbusch, from wax bas-relief	C. Hartman Kuhn	26

* Fellow of the College.

Subject	*Artist*	*Donor*	*PA No.*
*La Roche, René (1795–1872) *Practitioner, writer*	Unknown	J. Percy Keating	83
*Leib, Michael (1754–1822) *Memb. Congress; U. S. Senator*	Unknown	C. C. Harrison	79
*Leidy, Joseph (1823–1891) *Physician, naturalist*	James L. Wood	Mrs. Joseph Leidy, Jr.	39
———	Anna Lea Merrit	The artist	85
*Leonard, Charles L. (1861–1913) *Pioneer American roentgenologist*	Benedict Osnis	Phila. Roentgen Ray Society	97
*Lewis, Samuel (1813–1890) *Practitioner, bibliophile; president of the College, 1884, and eminent benefactor of the library*	Ida Waugh	Unknown	11
*Manges, Willis F. (1876–1936) *Roentgenologist*	Benedict Osnis	Phila. Roentgen Ray Society	97
*McClellan, George (1849–1913) *Anatomist, surgeon*	Julian Story	Mrs. George McClellan	88
*Mears, J. Ewing (1838–1919) *Surgeon, teacher*	F. Y. Heberton	Unknown	73
*Meigs, Arthur V. (1850–1919) *Practitioner, investigator; pres. of the College, 1904–06*	William M. Chase	Friends of the subject	3
*Mitchell, S. Weir (1829–1914) *Neuropsychiatrist, writer; pres. of the College, 1886–88, 1892–94*	R. W. Vonnoh	Cadwalader Mitchell	24
———	Dvorak	Library Committee of the College	87
———	Francis Holl	Loaned by Mrs. Mitchell Macdonough, Mrs. Vinton Freedley	
Monges, John A. (1759–1827) *Phila. practitioner, native of France*	Unknown	Gordon Monges	46
*Morgan, John (1736–1789) *Founder of first medical school in this country; co-founder of the College*	Isaac Craig, after Angelica Kauffman	Mrs. Amelia Shields	14
———	Unknown miniaturist	Mrs. Julia Morgan Harding	911 misc.
*Morton, Thomas G. (1835–1903) *Surgeon, historian*	Hugh H. Brechkenridge	Arthur V. Morton	71

* Fellow of the College.

Subject	*Artist*	*Donor*	*PA No.*
*MÜTTER, THOMAS D. (1811–1859) *Surgeon; donor of the College's Mütter Museum*	Daniel Huntington	Unknown	89
*NEILL, HENRY (1783–1845) *Practitioner; onetime vice-pres. of the College*	H. Winner	Family of the subject	5
*NORRIS, GEORGE W. (1808–1875) *Surgeon, father of the following*	M. H. Kevorkian, after Matthew Wilson	Unknown	44
*NORRIS, WILLIAM F. (1839–1901) *Ophthalmologist, son of the above*	M. H. Kevorkian	Unknown	45
*PACKARD, FRANCIS R. (1870–1950) *Otolaryngologist, historian; pres. of the College, 1931–33; brother of the following; son of John H. P.*	Justin Pardi	Francis R. Packard	109
*PACKARD, FREDERICK A. (1862–1902) *Internist; brother of the above; son of the following*	James L. Wood	Fellows of the College	90
*PACKARD, JOHN H. (1832–1907) *Surgeon; father of Francis R., and Frederick A., P.*	Hugh H. Breckenridge	Francis R. Packard	21
*PARKE, THOMAS (1749–1835) *Practitioner; co-founder of the College, pres., 1818–1835*	Unknown, after Naegle	George B. Wood	15
*PARRISH, JOSEPH (1779–1840) *Surgeon, teacher, editor; onetime vice-pres. of the College*	R. I. Furness, after Street	Mrs. Rodman Wharton	27
PHYSICK, PHILIP SYNG (1768–1837) *"Father of American surgery"*	R. F. Reynolds, after Inman	Mrs. Frances R. Brooks	113
———	Albert Rosenthal, after ?	Unknown	94
*RANDOLPH, NATHANIEL A. (1858–1888) *Physiologist, hygienist*	James L. Wood	Horatio C. Wood	69
*REDMAN, JOHN (1722–1808) *Practitioner, teacher; co-founder of the College and first pres., 1787–1805*	Unknown	George B. Wood	13
*RICHARDSON, JOSEPH G. (1836–1886) *Microscopist*	Unknown	Miss Josephine R. Howell	115
*RODMAN, LEWIS (1806–1891) *Obstetrician*	Unknown	Mrs. Lewis Rodman	53
*RUSCHENBERGER, W. S. W. (1807–1895) *Surgeon, writer; major historian of the College*	John Lambert, Jr.	Fellows of the College	18

* Fellow of the College.

Subject	*Artist*	*Donor*	*PA No.*
*Rush, Benjamin (1746–1813) *Physician, teacher, patriot; co-founder of the College*	Adele von Helmbold, after Sully	Catherine Rush, Mary Rush	17
———	Unknown miniaturist	George P. Muller	105
*Sajous, Charles de M. (1852–1929) *Writer and editor*	C. L. Sasportas	Miss Louise I. Weisgerber	108
*de Schweinitz, George E. (1858–1938) *Ophthalmologist; pres. of the College, 1910–12*	Julian Story	Rudolph Ellis	31
Self-portrait by insane patient when he imagined himself to be Christ	Benjamin Fox	Mrs. D. E. Hughes	42
*Shippen, William (1736–1808) *Anatomist, obstetrician, teacher; pres. of the College, 1805–1808*	Unknown	George B. Wood	19
*Sinkler, Wharton (1845–1910) *Neurologist; vice-pres. of the College, 1910*	Alice Mumford Roberts	Family of the subject	9
*Stillé, Alfred (1813–1900) *Practitioner, teacher, writer; pres. of the College, 1883*	Bernard Uhle	Unknown	4
Sydenham, Thomas (1624–1689) *English physician*	Anna Lea Merritt, after Mary Beale	John K. Bell	32
*Taylor, William J. (1861–1936) *Surgeon; pres. of the College, 1919–21*	Lazar Raditz	Fellows of the College	2
*Thomson, William (1833–1907) *Ophthalmologist*	Thomas Eakins	Unknown	77
*Tyson, James (1841–1919) *Teacher, writer; pres. of the College, 1907–1909*	Joseph De Camp	Friends of the subject	8
*Wilson, James C. (1847–1932) *Practitioner, teacher; pres. of the College, 1913–1915*	Frank B. A. Linton	Unknown	30
*Wistar, Caspar (1761–1818) *Anatomist*	Ida Waugh, after B. Otis	Mifflin Wistar	34
*Wood, George B. (1797–1897) *Pharmacologist, teacher; pres. of the College, 1848–1879; uncle of Horatio C. W.*	James L. Wood	George B. Wood (1871–)	118
———	Bernard Uhle	Richard Wood	28

* Fellow of the College.

Subject	*Artist*	*Donor*	*PA No.*
*WOOD, HORATIO C. (1841–1920) *Pharmacologist; pres. of the College, 1902–1903; nephew of the above*	James L. Wood	Fellows of the College	20
*ZENTMAYER, WILLIAM (1864–) *Ophthalmologist*	Daniel Garber	The College's Section on Ophthalmology	106

Non-Authenticated Subjects

PA 59. "Hippocrates". Painted by Fanny Darrach and presented by the artist.

PA 61. Regarded by S. Weir Mitchell as undoubtedly a contemporary portrait of William Harvey, artist unknown. Attribution not accepted by Geoffrey Keynes (1949). Presented by Mrs. H. C. Jenks.

PA 84. For many years, this portrait, by Robert Edge Pine, was labeled Philip Syng Physick. Attribution proved erroneous by William N. Bradley, M.D. Presented by S. Weir Mitchell.

PA 110. Subject and artist in doubt; supposed to be portrait of Benjamin Rush by Benjamin West. Presented by Mrs. Louis A Biddle.

Ella N. Wade
Curator of the Mütter Museum; Custodian of College Collections

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* Fellow of the College.

Pathological Society of Philadelphia

PROCEEDINGS

N.S. Vol. 38: NOVEMBER, 1949–MAY, 1950

Peter A. Herbut, *President*
Warner F. Sheldon, *Secretary*
John E. Gregory, *Chairman, Program Committee*

November 8, 1949

SYMPOSIUM ON THYROID HYPERPLASIA

THE DETERMINATION OF PROTEIN-BOUND IODINE AND ITS USE IN ESTIMATING THYROID ACTIVITY. William C. Foster. (*Abstract 1, below*)

RADIOACTIVE IODINE IN THE DIAGNOSIS OF ALTERED THYROID FUNCTION. Robert Robbins. (*Abstract 2, below*)

RECENT ADVANCES IN THYROID PHYSIOLOGY. M. J. Oppenheimer. (*Abstract 3, below*)

MORPHOLOGY OF THYROTOXICOSIS. Robert C. Horn. (*Abstract 4, below*)

December 8, 1949

PHYSIOLOGY OF POTASSIUM. J. Russell Elkinton. (*Abstract 5, below*)

CLINICAL ABNORMALITIES OF POTASSIUM METABOLISM. Joan Long. (*No abstract received*)

CARDIAC MANIFESTATIONS OF ABNORMAL POTASSIUM METABOLISM. Thomas M. Durant. (*Abstract 6, below*)

PATHOLOGY OF ABNORMAL POTASSIUM METABOLISM. William N. Campbell. (*Abstract 7, below*)

January 12, 1950

STUDIES ON THE TRANSFORMATION OF NORMAL AND MALIGNANT CELLS. George O. Gey. (*No abstract supplied*)

February 9, 1950

MAST CELL TUMORS IN DOGS WITH SPECIAL REFERENCE TO TISSUE CULTURE. George H. Paff. (*Abstract 8, below*)

NEWCASTLE DISEASE IN FOWL AND ITS POSSIBLE RELATION TO DISEASE IN HUMANS. E. L. Stubbs. (*Abstract 9, below*)

EQUINE ENCEPHALOMYELITIS. Raymond A. Kelser. (*No abstract supplied*)

March 9, 1950

ANNUAL JOINT MEETING WITH SECTION ON CLINICAL PATHOLOGY OF THE COUNTY MEDICAL SOCIETY.

April 6, 1950

SLIDE SEMINAR: "The Differential Diagnosis of Osteosarcoma". Ernest E. Aegerter and Temple Group.

May 11, 1950

ENDOCRINE TUMORS OF THE OVARY: Clinical Aspects. Mary D. Pettit. (*Abstract 10, below*); Endocrine Aspects. A. E. Rakoff. (*No abstract supplied*); Pathological Aspects. R. J. Faulconer and James Butcher. (*Abstract 11, below*)

ABSTRACTS

Abstract 1

THE DETERMINATION OF PROTEIN-BOUND IODINE AND ITS USE IN ESTIMATING THYROID ACTIVITY. William C. Foster.

The significance of blood protein-bound iodine (BPBI) in clinical medicine has only recently been recognized. This fraction of iodine is bound to blood protein and parallels the thyroid gland activity. Its level is high in hyperactivity of the gland, low in hypoactivity.

McClendon and Foster (1938) reported a method for determining the BPBI and showed that thyroxine, the thyroid hormone, when added to blood, was completely recovered (1).

In 1941 these investigators found a high correlation between the BPBI and the B. M. R. (correlation coefficient 0.627) in 373 patients (2).

Factors which influence the BPBI are thyroxine, desiccated thyroid gland, Lugol's, iodine-containing gall-bladder dyes, and metallic iodides.

Four agents commonly used in precipitating blood protein for iodine analyses are alcohol, hot distilled water, trichloracetic acid, and zinc hydroxide. Methods employed for the destruction of organic material, freeing iodine for determination, are the closed combustion method of McClendon and Bratton, the Parr oxygen bomb, and wet digestion. In the last, organic matter is digested by either potassium permanganate or chromic and sulfuric acids.

The iodine may be determined electrometrically or by its catalytic effect on the reduction of ceric to cerous sulfate by arsenious acid.

The value of BPBI is summarized as follows:

1. To complete the diagnostic picture.
2. Where doubt exists in the accuracy of the B. M. R. determinations. (Fever, emotion, etc.)
3. In antithyroid drug therapy.
4. In measuring thyroid activity in infants and children.

REFERENCES

1. McClendon and Foster: Proc. Soc. Exptl. Biol. Med. **39**, 230–1 (1938).
2. McClendon and Foster: Endocrinology **28**, 412-8 (1941).

Abstract 2

Radioactive Iodine in the Diagnosis of Altered Thyroid Function. Robert Robbins.

The function of the thyroid, as measured by its avidity for iodine, may be assayed by the so-called "tracer" technic, with I one hundred and thirty-one. In this technic, a small dose of this radioactive isotope of iodine is given orally, and the amount of radioactivity over the thyroid gland is measured externally with a Geiger counter. Since the thyroid is unable to distinguish between ordinary stable iodine and the radioactive iodine, the uptake of the I one hundred and thirty-one in the gland is a measure of the fate of all iodine. The urinary excretion is also diagnostically important.

Euthyroidism is characterized by a thyroid retention of 20–40% of the given dose of I one hundred and thirty-one at the end of twenty-four hours, and by a urinary excretion of about 50% at this time.

Hypothyroidism is characterized by a thyroid retention of less than 15% and a urinary excretion of more than 60%, under the same circumstances.

Hyperthyroidism is characterized by a thyroid retention of over 40%, and a urinary excretion of about 20% at twenty-four hours.

The method is an exceedingly sensitive one; this must not be misinterpreted as being decisive in accuracy, however. The various clinical divisions of thyroid activity have "distribution" curves of thyroid uptake of iodine, producing overlapping in the borderline states, as with any other laboratory method.

The method has the great advantage of measuring thyroid activity unaffected by the physical or emotional state of the patient.

Abstract 3

Recent Advances in Thyroid Physiology. M. J. Oppenheimer.

The principal functions of the thyroid are control of oxidative metabolism, growth and differentiation. Thyroxin contains iodine. Iodine may be fixed in the thyroid by conversion to organic form (blocked by thiouracil) or concentrated as iodide (opposed by thiocyanates). Blood iodide exists as such and in loose nonspecific linkage with small albumins and alpha and beta-globulins (protein bound iodine).

Proteolytic enzymes within the thyroid follicle reduce large thyroglobulin molecules to smaller products of hydrolysis which can enter the blood stream. The proteolytic activity is increased in hyperthyroidism. Iodides may exert their beneficial effects on this proteolytic activity.

Criteria of thyroid activity are important. Hormone synthesis and histological criteria

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need not be correlated. Normal glands containing adequate iodine take up radio iodine slowly as organic iodine, glands containing little hormone and total iodine take it up rapidly (holding it for short periods) as iodide. Large sized glands may be hyper or hypofunctioning. Both types of function have increased vascularity, taller cells which encroach on lumina, dilute colloid, and loss of protein bound iodine. Differences depend on BMR, blood protein bound iodine, and collection of iodine in tracer studies, all of which are increased in hyperthyroidism.

Anterior pituitary stimulates thyroid by means of thyrotropin, thyroxin inhibits anterior pituitary. Interruption of this reciprocal relationship when thyroxin is not formed gives "antithyroid effect": pituitary released from inhibition, more thyrotropin formed, thyroid hyperplastic with symptoms of hypothyroidism.

Goiter is a means of counterbalancing iodine deficiency, vascular hyperplastic gland is more efficient concentrating iodine.

Abstract 4

Morphology of Thyrotoxicosis. Robert C. Horn.

The thyroid gland presents unusual opportunity to assess function by morphologic study but this ease of interpretation is deceptive because of the many variables introduced by the wide range of "normality," by geographic variations, by the usual uneven distribution of functional activity and by alterations growing out of the hyperplasia—involution cycle, even in the absence of clinical disease. Furthermore, thyroid hyperplasia from any cause assumes the same morphologic appearance and this appearance is by no means synonymous with hyperfunction.

The pathologic basis of thyrotoxicosis may be a nodular goiter, often so complex that correlation with functional state is impossible by routine methods. More often encountered is the diffusely hyperplastic goiter, in the past quarter-century almost invariably altered by some degree of pre-operative iodine-induced involution.

The introduction and recent widespread use of the antithyroid drugs, together with the increased knowledge of thyroid physiology yielded particularly by studies with radioactive iodine, have made it almost impossible to judge thyroid functional activity morphologically without careful correlation with clinical and physiologic data. These drugs, while preventing thyroxine production, induce a hyperplasia superimposed upon that which is a part of the disease. Since it has become customary to use iodine to complete the pre-operative preparation of the patient primarily treated with antithyroid compounds, variable degrees of involution are added to the existing complexities.

Not infrequently, in the thyroids of patients who have received antithyroid drugs extreme cellularity, many Hurthle cells and striking nuclear pleomorphism and hyperchromatism are encountered, the picture as a whole suggesting an early stage of exhaustion atrophy, which may be difficult to distinguish from carcinoma.

Abstract 5

Physiology of Potassium. J. Russell Elkinton.

The transfers of potassium in the normal organism may be designated as the exchanges with the environment (intake and output) and the internal exchanges between extracellular fluid and the cellular phase of various tissues. The latter exchanges are probably related to energy producing processes within the cells. Disturbances of these transfers in disease may be divided into the following categories: (A) Deficiency of potassium due to (1) lack of intake in starvation or in patients maintained on parenteral potassium-free fluids; (2) excessive output in patients with gastrointestinal fluid loss, hyperfunction of the adrenal cortex or treatment with desoxycorticosterone, A.C.T.H., cortisone, and cation exchange resins. (B) Excess of potassium, at least in extracellular fluid, due to inadequate excretion in (1) anuria or oliguria, or (2) adrenal cortex insufficiency. (C) A miscellaneous group of conditions including (1) internal maldistribution as in famil-

ial periodic paralysis and (2) a combination of the above factors during the early treatment of diabetic acidosis where the extracellular concentration of potassium falls because of (a) expansion of the extracellular fluid, (b) continued renal excretion of potassium, and (c) deceleration of the transfer of potassium from cells.

Abstract 6

CARDIAC MANIFESTATIONS OF ABNORMAL POTASSIUM METABOLISM. Thomas M. Durant.

Electrocardiographic study provides a very important adjunct in the investigation of the effects of hypo- and hyperpotassemia on the heart since very definite changes in cardiac repolarization are produced in both conditions in most instances, and in severe disturbances of the latter type there may be changes in depolarization. In hypopotassemia there is a prolongation of the Q-T interval which is the result of broadening of the base of the T-wave. In some there may be lowering of the T-wave and sagging of the S-T segment. These findings differ from those in hypocalcemia in that the prolongation of the Q-T interval in the latter condition is not due to widening of the T-wave, but rather to prolongation of the S-T segment. It is often possible to make the distinction between these two conditions electrocardiographically although there may be difficulty when the two coexist. In hyperpotassemia such as is seen in the late stages of renal insufficiency there is a shortening of the Q-T interval with tall, sharply pointed T-waves. This may be most evident in the right precordial leads. The R-wave tends to decrease in amplitude. In advanced stages of hyperpotassemia there may be auricular arrest and prolongation of the QRS interval. The latter may be sufficiently marked to result in a blending with the T-wave. It is possible that the very tall, narrow T-waves sometimes seen in the precordial leads in the very earliest stages of severe myocardial ischemia may be the result of a local release of potassium in the injured region.

Abstract 7

PATHOLOGY OF ABNORMAL POTASSIUM METABOLISM. William N. Campbell.

Blood serum and spinal fluid contain progressively higher amounts of potassium shortly after death so that postmortem samples of blood or spinal fluid will not aid in determining whether or not any patient had suffered from potassium imbalance. Death may occur in hyperpotassemia without any gross or microscopic morphologic change. Focal necrotic areas with a cellular infiltrate usually composed of mononuclear cells have been described in the myocardium of rats maintained on a potassium deficient diet. These lesions, as well as non-specific degenerative tubular changes in the kidneys, are not pathognomonic of hypopotassemia. Similar lesions in the heart and kidneys of humans, suffering from Addison's disease, who were overtreated with DOCA during crisis, have been described.

Another lesion ascribed to potassium deficiency is a depletion of total lipids and cholesterol fractions of the zona glomerulosa of the adrenal cortex, these findings also being reported in the experimental animal.

Because morphologic lesions produced by potassium imbalance are non-specific in type or completely absent, the autopsy pathologist should become familiar with the conditions which predispose to abnormal alterations, carefully examine clinical histories of autopsied cases with reference to these conditions and also review any antemortem ECG and electrolytic studies, in order to help elucidate some of the obscure cases which have been problems for pathologists and clinicians.

Abstract 8

MAST CELL TUMORS IN DOGS WITH SPECIAL REFERENCE TO TISSUE CULTURE. George H. Paff.

Mast cell tumors represent 15% of all subcutaneous tumors found in dogs (Bloom) and afford an excellent source of material for extractive and cytological studies. Thus extraction studies by Oliver, Bloom and Mangieri proved the contention of Weilander, Jorpes and others that the mast cell produces heparin. The former author recovered an anticoagulant of high potency in large amounts from tumor tissue composed of mature mast cells.

Despite the ability of the mast cell to produce heparin it is remarkable that the blood clotting time is normal even in dogs bearing tumor tissue measurable in pounds. This aroused our curiosity as to how the living cells might be induced to liberate their anticoagulant. The most productive experimental procedure proved to be degeneration. Failure to transplant mast cells growing in tissue culture leads to their degeneration. The degenerate cells were then stained supravitally with a deep sky blue toluidin blue-Tyrode solution (i.e., a few grains of dye in Tyrode solution) and an interesting series of events were observed. In some cells the cytoplasmic granules underwent solution and metachromatic material (presumably heparin) could be observed as it diffused from the cytoplasm into the surrounding medium. In other cells the granules underwent solution, many vacuoles were formed within the cytoplasm, and the cells resemble masses of foam. The vacuoles may discharge their metachromatic material into surrounding medium. Occasionally vacuoles may be observed floating in the medium.

The changes described above are degenerative in nature. However, isolated observations gleaned from the literature lead one to believe that the same method of releasing heparin from the mast cells may occur *in vivo*.

Abstract 9

NEWCASTLE DISEASE IN FOWL AND ITS POSSIBLE RELATION TO DISEASE IN HUMANS. E. L. Stubbs.

Newcastle disease is an acute, subacute or chronic virus disease of chickens and other birds, characterized by dullness, ruffled feathers, dyspnea, diarrhea and frequently nervous manifestations. A new disease occurring in the United States, where it has been found in a much less virulent form than found in other countries where it has occurred during the last twenty-five years.

The respiratory symptoms simulate those of several other respiratory diseases in chickens, making its diagnosis difficult. Its identification requires isolation of the virus by chick embryo inoculation, the presence of hemagglutination inhibition antibodies or the presence of neutralizing antibodies. The virus has been adapted to hamsters and rhesus monkeys, but only by intracerebral passage.

The virus resembles influenza virus, being of the same particle size, multiplying in developing chick embryos with a high titer fluid, similar lesions and agglutinating the same types of red cells. A few cases have been reported in human beings, mostly in persons working with the virus or in close association with affected chickens. The disease in humans has been most often in the form of a conjunctivitis with transient symptoms and the development of hemagglutination inhibition antibodies and neutralizing antibodies.

Experimental work has indicated a resemblance to the virus of anterior poliomyelitis. Work done with monkeys and the blood of convalescent mumps patients shows substances that cause hemagglutination inhibition of chicken red cells and neutralization of the virus.

The possible relationship of Newcastle disease to disease in humans needs further study. The great prevalence of the disease in chickens and the few reported cases in humans would indicate Newcastle disease is not a disease hazard to humans at present.

Abstract 10

ENDOCRINE TUMORS OF THE OVARY: CLINICAL ASPECTS. Mary DeWitt Pettit.

The clinical signs, symptoms and physical findings in patients with ovarian neoplasms in general were reviewed. The special characteristics of the endocrine tumors were then outlined: The "Feminizing" tumors; granulosa cell, theca cell, luteinized granulosa cell and luteinized theca cell tumors were discussed. Unless an ovarian neoplasm produces hormones, it rarely affects the menstrual habit. Therefore, the presence of a definite ovarian tumor, in the absence of a uterine lesion, associated with bleeding abnormal to that patient should alert the physician to the possibility of a feminizing tumor. Vaginal smears,

hormone assays may be helpful. At operation, careful inspection of the tumor for rupture of the capsule and local extension will determine whether unilateral oophorectomy or panhysterectomy, bilateral salpingo-oophorectomy should be performed. Deep x-ray therapy may be given post-operatively if indicated. Recurrence rate is about 25% so that the malignant potentialities of these neoplasms must be seriously considered. Arrhenoblastoma and ovarian hilus cell tumors are the "Masculinizing" tumors. The same criteria apply to these excepting that the woman shows signs of defeminization and progressive masculinization. The patient will resume her normal menstrual habit and feminine characteristics as soon as removal of the hormone producing tumors is accomplished. Recurrence rate in the masculinizing group is about 20%. A third group of tumors was discussed. Dysgerminoma in which the cell type is too immature to produce hormones is still a related tumor. The presence of this type is often associated with pseudo-hermaphrodism. Removal of these tumors will not change the basic congenital abnormality in the person. Recurrence rate is given variously as 25 to 80%. Surgery plus irradiation is the treatment of choice. Other neoplasms such as struma ovarii, gynandroblastoma and Brenner tumor were mentioned in differential diagnosis.

Abstract 11

ENDOCRINE TUMORS OF THE OVARY: PATHOLOGICAL ASPECTS. Robert J. Faulconer and James Butcher.

The functional ovarian tumors are sufficiently rare to present moderate difficulty in pathological diagnosis and challenging problems in pathogenesis. The most satisfactory studies of histogenesis are based upon a sound understanding of the development of the gonads (*Table I*) and an appreciation of the potentialities present in the maturing and adult ovary (*Table II*).

The granulosa cell tumor and the arrhenoblastoma are the basic feminizing and masculinizing neoplasms, having their embryonic origin in the coelomic epithelium of the primitive genital ridge. The diverse histological and cytological patterns assumed by the variants of these tumors are expressions of the capacity to recapitulate phases of their complex history.

The theca cell tumors and luteinized granulosa cell tumors are derived tumors. Theca cell tumors differentiate from the ovarian stroma under stimulus of the granulosa elements adjacent to that tissue. The histologically "pure" feminizing tumor is exceedingly rare due to the close relationship existing between granulosa cells and the ovarian stroma.

TABLE 1

ORIGINS OF THE HUMAN GONADS

GENITAL RIDGE	GENITAL PRIMORIDUM	TESTIS	OVARY
Coelomic epithelium	Sex cords	Seminiferous tubules (Sertoli cells)	Granulosa cells Rete ovarii
	Primitive germ cell (by migration)	Seminiferous tubules (Spermatogonia)	Ovum
Primitive mesenchyme	Mesenchyme	Interstitial cells	Theca cells, ovarian stroma

TABLE 2

HISTOGENESIS OF ENDOCRINE TUMORS

ADULT OVARY	GENITAL PRIMORDIUM	ENDOCRINE TUMORS
Granulosa cells rete ovarii	Sex cords	Granulosa cell tumor, arrhenoblastoma
Ovarian stroma theca cells	Mesenchyme	Thecoma, arrhenoblastoma, hilus cell tumor, adrenal-like tumor
Ovum	Primitive germ cell (by migration)	

The ovarian hilus is the site of a second masculinizing tumor, apparently unrelated to the arrhenoblastoma. The tumor is composed solely of interstitial cells, resembling the Ley-

dig cells of the adult testis in cytological detail. The cases studied are too few to clarify histogenesis. It is believed to stem either from metaplasia of ovarian mesenchyme or represent hyperplasia of existing deposits in the hilus.

Functional tumors composed of adrenal-like cells occur rarely. Long attributed to activation of embryonal adrenal rests, these tumors, on the basis of exacting observation and experimentation, now seem to arise directly from ovarian stroma by metaplasia. The stimulus responsible for this remains obscure.

Ovarian teratomas may become functional in the presence of struma ovarii or of primary chorionepithelioma.

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Changes in Membership

New Members

	Date of Election		*Date of Election*
Rothrock, Henry	11–8–49	Pebley, Evelyn	1–12–50
Platt, William R.	12–8–49	Wooding, Cornelius G.	2–9–50
Casella, Joseph V.	12–8–49	Schmidt, Edward C. H.	5–11–50
Shuman, Richard	12–8–49	Harvey, Thomas S.	5–11–50
Enterline, Horatio T.	12–8–49	Leitner, M. J.	5–11–50
Eiman, John W.	12–8–49	Irey, Nelson	5–11–50
McGraw, John J., Jr.	1–12–50	Christian, Elizabeth	5–11–50

Resignations

Garlichs, Richard (1948)
Hand, Alfred (1949)
Hueper, W. C. (1949)
Rawson, A. J. (1950)

Deaths

Boyer, H. P. (1949)
Foster, George B. (1949)
Swan, John M. (1949)

TRANSACTIONS & STUDIES

of the

College of Physicians of Philadelphia

Volume 18 (Fourth Series)

Number 3 (December 1950)

The Antirheumatic Effects of Cortisone and Pituitary ACTH*

By PHILIP S. HENCH†, M.D., EDWARD C. KENDALL‡, PH.D., CHARLES H. SLOCUMB†, M.D., and HOWARD F. POLLEY†, M.D.

CORTISONE, a hormone of the adrenal cortex, and ACTH, the adrenocorticotropic hormone of the pituitary, have been given to patients with rheumatoid arthritis, acute rheumatic fever and certain other articular conditions.

EFFECTS OF JAUNDICE AND PREGNANCY ON RHEUMATOID ARTHRITIS

The decision to test the worth of these hormones against rheumatoid arthritis was derived from studies begun twenty-one years ago (1). On April 1, 1929, it was observed that when a rheumatoid patient has jaundice of certain types and of a certain intensity, the arthritis disappears temporarily.

In 1931 were begun studies on the ameliorating effect of pregnancy on rheumatoid arthritis (2). Thereafter increasing attention was paid to these two phenomena, and many attempts were made to reproduce them by various means. From these studies the conclusion was derived that rheumatoid arthritis was not necessarily a relentless progressive disease but was potentially reversible.

CONJECTURES REGARDING SUBSTANCE X

Certain conjectures followed: 1. There existed in jaundiced or pregnant rheumatoid arthritics an antirheumatic "substance X"(1, 3, 4). 2. Since certain allergic and other nonrheumatic conditions also may be relieved during jaundice and pregnancy, the phenomenon of relief is not disease-specific, that is, specific in only one disease, but is group-specific (3, 5). 3. Because nonjaundiced pregnant women and jaundiced males are relieved in an apparently similar manner, the antirheumatic substance X is not a unisexual (female) hormone nor the product of a damaged liver (1, 2, 6). 4. Substance X is probably a biologic compound which is normal to the human organism (6), one which is specific in nature and function (3, 7). 5. Substance X might be an adrenal hormone (2, 8); it is known that certain agents (anesthesia, surgical operations, foreign protein reactions, starvation) which often produce remissions of rheumatoid arthritis (1, 5), stimulate the ad-

*Based on the Nathan Lewis Hatfield Lecture XXXIV, College of Physicians of Philadelphia, 19 April 1950, delivered by Dr. Hench.

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renal cortex. Despite the slow development and deepening interest in these conjectures we had, before September 21, 1948, no firm conviction, only the hope that compound E might be substance X.

In addition to the speculations concerning the adrenal gland other possibilities were entertained from time to time. Thus in 1938 we gave adrenal lecithin to a few patients with rheumatoid arthritis, not as an adrenal product, but in an attempt to produce hyperlipemia which often accompanies jaundice or pregnancy. In January, 1941, it was decided to administer Kendall's compound E (17-hydroxy-11-dehydrocorticosterone), which we have since named "cortisone," whenever it might become available, but sufficient material was not yet available for clinical testing. In lieu of compound E we gave, in 1941, Kendall's adrenal cortex extract, "cortin," to 3 patients with rheumatoid arthritis without effect.

Meanwhile the thirteen years which were required by Kendall and his associates to devise a method by which compound E could be produced by partial synthesis were drawing to a close. Dr. L. H. Sarett, research chemist of Merck & Co., Inc., made an essential contribution to the completion of this endeavor. As a result of these labors cortisone was finally made available to us in September, 1948, through the courtesy of Dr. James Carlisle, Medical Director, Merck & Co., Inc. In January, 1949, we requested a supply of pituitary ACTH from Dr. John R. Mote, then medical director of The Armour Laboratories; it was first administered in February, 1949.

DOSAGES AND DURATION OF ADMINISTRATION OF CORTISONE OR ACTH IN RHEUMATOID ARTHRITIS

Cortisone was administered, in some cases continuously, that is, daily for varying periods from eight to 187 days. It was given more or less continuously to 2 patients for a total of 215 and 218 days respectively. Daily doses, given intramuscularly, varied from 25 to 300 mg. but were usually 100 mg.

The pituitary adrenocorticotropic hormone, ACTH, which stimulates responsive adrenal glands to make their own cortisone or a cortisone-like substance, such as compound F, was given daily for periods varying from eleven to eighty-seven days. The daily doses varied from 45 to 140 mg. but were usually 100 mg.*

EFFECTS OF CORTISONE AND ACTH ON RHEUMATOID ARTHRITIS

Clinical Effects. The effects of cortisone or ACTH in our first series of cases of rheumatoid arthritis have been reported elsewhere (9). When either hormone was administered intramuscularly, there was a rapid and marked reduction in symptoms and signs of the disease. Stiffness of muscles and joints, muscular weakness, and articular soreness, tenderness and swelling diminished. The maximal initial subjective response usually developed within eight days, the maximal initial objective response within two or three weeks. When administration of the hormones was continued, the maximal over-all improvement often developed after two or three months of hormonal usage.

Appetite and weight increased. Fever, if present, usually disappeared. Mental and physical energy usually increased. Subcutaneous rheumatoid nodules and enlarged lymph nodes frequently diminished in size. Flexion-contractures usually diminished; those of shorter duration often disappeared within three weeks. In contrast to the reversibility of abnormalities due to acute inflammation and muscular spasms therefrom, the pathologic residues of the disease were unaffected. Articular deformities resulting from architectural damage to cartilage and articular bone or from fibrotic contractures were not improved.

Biochemical and Metabolic Effects. Sedimentation rates during the use of cortisone or ACTH became normal in most cases, almost normal in a few and were reduced but not to normal in a few. Once reduced, the sedimentation rates in some cases remained normal as long as adequate doses of the hormones were

*Smaller daily doses are now being used.

given; in other cases they varied in the neighborhood of near normal values, and in a few cases rose again.

Concentrations of hemoglobin and erythrocyte counts increased in several cases. Abnormally increased concentrations of serum globulin were reduced and albumin-globulin ratios became more nearly normal.

A variety of metabolic and other biochemical effects were studied in collaboration with Sprague, Mason, Albert, Mathieson and Power (10). In general the effects bore a qualitative relation to the doses of cortisone or ACTH used and to the duration of administration. There was a general tendency for an initial retention and later a liberation of salt and water, and reduction of serum potassium but in only 1 case was the last severe. Cortisone in doses of 100 mg. daily usually induced minimal or no alterations in plasma electrolytes or in balance for sodium, potassium, chlorides or nitrogen. But daily doses of 200 mg. of cortisone or 100 mg. of ACTH sometimes produced a negative nitrogen balance and a transient hypochloremic hypopotassemic alkalosis. When present, the latter was often mild and apparently nonproductive of symptoms; occasionally it was marked and appeared to be correlated to certain symptomatic side effects (for example, muscular weakness and characteristic electrocardiographic changes).

No marked impairment of carbohydrate tolerance occurred among the rheumatoid patients given cortisone or ACTH, although administration was prolonged in several cases. Fasting blood sugars remained normal. No significant glycosuria developed. Glucose tolerance tests were performed during the use of cortisone in 9 cases: results were normal in 5 and abnormal in 4. It would appear that these hormones, when given in the doses usually employed in our cases, do not markedly reduce the carbohydrate tolerance of rheumatoid patients who do not have latent or frank diabetes. But for any patient who has latent or frank diabetes these hormones should be expected to produce transient reduction of carbohydrate tolerance (11).

Histopathologic Effects. Articular biopsies, made in several cases before and after the administration of various amounts of cortisone or ACTH, revealed that definite, sometimes marked, reduction of synovial and subsynovial inflammation resulted from use of the hormones.

Undesirable Effects. The prolonged use of either of these hormones may produce certain side effects which will be discussed later.

Result of Hormonal Withdrawal. When the use of either hormone was discontinued, a relapse generally occurred, sometimes promptly, sometimes slowly. These relapses responded again to the further use of the hormones. When patients received more than one course of either hormone, they responded to each course in much the same manner. When relapses occurred, they were partial and temporary in some cases, complete and persistent in most cases, unless cortisone or ACTH were given again.

Posthormonal Remissions. In a few cases significant relapses did not occur until five to fourteen months after use of cortisone or ACTH was discontinued.

CORTISONE AND ACTH FOR ACUTE RHEUMATIC FEVER

Cardiac muscle and fibrous tissue of heart valves are not very different from the skeletal muscle and fibrous tissues which are so promptly benefited in rheumatoid arthritis. Therefore, with our colleagues Drs. A. R. Barnes and H. L. Smith, we have studied the effects of cortisone or ACTH on several patients who had acute rheumatic fever with or without carditis and on a few who had severe rheumatic carditis and cardiac failure (12–14).

Dosages. The doses used are given elsewhere (13). The initial daily dose of cortisone was usually 200 mg.; these doses were given daily for from two to nineteen days, but generally for ten to twelve days. Then when the acute manifestations were largely controlled, the daily doses were reduced to 100 mg. or less. Total doses were about 3.5 to 5 gm. within twenty-two to forty days. Initial daily doses

of ACTH ranged from 25 to 60 mg. but were usually 45 mg. After a few days the doses were gradually reduced to 10 or 15 mg. daily. Total doses of about 400 to 825 mg. were given within sixteen to thirty-eight days. Doses of either hormone varied somewhat depending on the age and size of the patient and severity of the disease.

Initial Clinical Results. Fever, acute polyarthritis and tachycardia disappeared within a few days after the initial doses were given. Sedimentation rates became normal, usually within twelve to twenty days. Hyperglobulinemia was reduced and albumin-globulin ratios became normal. P-R intervals in the electrocardiogram, when increased, generally became normal within a few days.

When the heart was enlarged, the cardiac size was reduced markedly in some cases, moderately in others during the use of cortisone. The heart of 1 patient who had ancient endocarditis and marked cardiac enlargement did not diminish in size during the use of cortisone, but symptoms of cyanosis, dyspnea and orthopnea were abolished. It was concluded that cortisone and ACTH can greatly improve the status of some patients with acute rheumatic carditis but do not modify pre-existing chronic valvular damage and the associated cardiac hypertrophy.

In several cases the use of the hormones apparently was discontinued prematurely, whereupon one of the manifestations (rising sedimentation rate, tachycardia, increasing P-R interval, slight fever or mild arthritis), or several or all of these manifestations reappeared but disappeared again when use of the hormones was resumed and continued long enough. Thus these hormones are capable of suppressing the symptoms and signs of acute rheumatic fever but they do not cure the disease, and it is probable that they do not shorten the natural duration of the acute process. However it seems reasonable to hope that, if given properly, these hormones may suppress the acute rheumatic inflammation in cardiac tissues sufficiently to prevent significant cardiac residues.

Later Results. Re-examinations of the hearts were made in several cases eight to ten months, and in a few cases a month or more, after use of the hormones was stopped. To date (average about six months) no definite evidence of new, or increased old, rheumatic carditis has developed (14). More prolonged observations will be required to determine whether cortisone or ACTH will prevent the initial development or aggravation of rheumatic carditis.

Optimal Administration. Optimal dosage and duration of administration remain to be established; but if one regards six to twelve weeks as the usual duration of the acute stage of rheumatic fever, in an attempt to provide adequate cardiac protection during this acute phase, one should give full doses of cortisone or ACTH daily for three or four weeks or at least until four weeks after the onset of symptoms; then one should use lower doses for perhaps two or three weeks more. Then one should discontinue the doses, being ready to resume their use until the persisting absence of signs and symptoms indicate that the "inherent duration" of the patient's acute disease is over.

EFFECTS OF CORTISONE AND ACTH ON CERTAIN OTHER CONDITIONS

Articular Diseases (9). An osteo-arthritic joint of 1 patient became symptomless as a result of cortisone given for leukemia. In 2 cases of tuberculous arthritis cortisone affected favorably certain hyperergic responses; symptoms and sedimentation rates were reduced but bacteriologic and pathologic remissions did not occur.

Diseases with Articular Complications. A few patients with disseminated lupus erythematosus have been given cortisone or ACTH. Articular symptoms and usually also fever, skin eruptions and serositis were temporarily suppressed. Yet the disease was not cured and the characteristic laboratory abnormalities were not influenced markedly. Nevertheless, significant remissions may result (15). Although fatal terminations were merely delayed in some cases, our first patient, one with severe dis-

seminated lupus who received cortisone daily for 166 days, has, except for occasional flares of arthralgia, remained in fairly good health for almost a year (9, 15).

Psoriatic arthritis appears to be more responsive to these hormones than the associated skin lesions. Detailed results are being reported (16).

The intestinal symptoms of 2 of 4 patients with chronic ulcerative colitis, given cortisone by our colleagues, Dearing and Brown (17), showed subjective improvement. Relief was transient in 1 case, persistent in the other. The complicating arthritis in this latter case also disappeared. Although roentgenograms showed no objective change in the colitis, the articular and intestinal symptoms had not recurred seven months after the use of cortisone was discontinued.

Other Conditions. Because certain nonrheumatic and allergic conditions, such as asthma, hay fever, egg sensitivity and migraine, are often relieved during jaundice or pregnancy, the belief was expressed in 1940 that when substance X was identified it might well be as useful in these conditions as in rheumatoid arthritis, since the phenomenon of relief appeared to be group-specific rather than disease-specific (5).

The hay fever of 2 of our rheumatoid patients gave little or no trouble during the us of cortisone in doses of 100 to 200 mg. daily in 1 case, and of 100 mg. daily in the other. Symptoms of bronchial asthma and hay fever due to ragweed pollen were markedly diminished during the use of cortisone in 3 cases observed by our colleagues, Carryer and his associates (18).

The bilateral neurodermatitis of 1 of our rheumatoid patients disappeared as a result of use of cortisone. Symptoms of bronchiectasis were markedly reduced in another during the use of cortisone.

These preliminary observations are interesting, but, to determine the limits of usefulness of cortisone and ACTH in such nonrheumatic conditions, further and more prolonged observations must be made.

UNDESIRABLE PHYSIOLOGIC EFFECTS (SIDE EFFECTS) OF CORTISONE AND ACTH

Cortisone and ACTH are potent agents capable of affecting many bodily functions and tissues other than those of joints and muscles. Of the varied effects (all of which are physiologic, and not "toxic" in the usual sense) some are desirable, some are relatively unimportant, and others are undesirable. The latter, commonly called "side effects," have been discussed in detail elsewhere (9, 10).

Relation to Dosage, Sex and Age. Undesirable side effects usually (but not always) developed in patients who received one or the other hormone continuously for a relatively long time or "large doses" (200 mg. of cortisone or 100 mg. of ACTH daily) for a shorter time. Individual tolerance played a role: males tolerated greater doses and longer administration than did females, especially menopausal females, and adolescents.

Nature of Side Effects. Somewhat in the order of frequency the following have been seen to develop, chiefly among rheumatoid patients during fairly prolonged use of the hormones: minor alterations of psyche (euphoria or mild restlessness); transient retention of salt and water with appearance of edema or rapid gains in weight or both (these often disappeared spontaneously after a few days); hirsutism or acne which was generally mild; rounding of face from deposition of fat; irregular menses or transient amenorrhea and transient posthormonal weakness and lassitude.

Blood pressures did not increase significantly among rheumatoid or other normotensive persons, but these hormones, especially ACTH, may increase the blood pressure of patients who have renal or vascular disease or hypertension.

Significant disturbances of electrolytes rarely developed among patients with unrestricted diets.

Major disturbances of psyche related to hormonal usage have been noted on rare occasions and developed in a rather predictable way among some persons with cyclothymic,

obsessional or frankly pre-psychotic or psychotic personality patterns (19). They have been transient and reversible, like all the other undesirable effects.

General Incidence. Among our first series of rheumatoid patients given cortisone or ACTH for about two weeks to about seven months, about 40 per cent did not have significant side effects, about 35 per cent had mild side effects and about 25 per cent more marked effects. The incidence of side effects has been much lower in our second series of cases of rheumatoid arthritis for a variety of reasons, chiefly because after the initial use of fairly large doses, reduced maintenance doses have often been used effectively.

Among patients with acute rheumatic fever undesirable effects have been less frequent and less marked since long-continued use of the hormones has not been required. Among adolescents with acute rheumatic fever mild acne, striae, rounding of face, or transient amenorrhea has frequently developed. These have disappeared gradually after use of the hormones has been discontinued. For rheumatic patients with cardiac decompensation temporary retention of salt and water may provide a transient hazard to hormonal usage.

Reversibility. To date all undesirable effects have been transient and reversible, disappearing with varying speeds after the doses were reduced or discontinued.

Prevention or Correction. Currently the best protection against the development of significant undesirable effects is to use, possibly intermittently, the smallest effective daily and total dose. Side effects may not present much of a problem in the investigative management of acute conditions for which relatively short-term administration may suffice. For conditions requiring prolonged use of these hormones preliminary successes in the prevention or control of unwanted effects have been attained by the use of the following measures in appropriate cases: for the prevention or correction of edema, limitation of intake of salt to about 1 gm. or the oral use of potassium nitrate, 4 to 6 or more gm. daily or both; for the prevention of potassium deficits, the daily oral use of 4 to 6 gm. of potassium chloride; for prevention of nitrogen deficits, the use of a diet unrestricted as to protein; for the prevention of major psychologic reactions, a study of the patient's personality pattern, the avoidance, if possible, of hormonal usage (at least in large doses for long) for the patients with notably disturbed psyche, and the use of sedatives. The combined use of estrone (about 5 mg. twice weekly) and cortisone appeared to prevent most of the annoying side effects which developed in 1 menopausal patient from use of cortisone alone (9).

THE ANTIRHEUMATIC EFFECT OF CERTAIN OTHER SUBSTANCES

In the hope of finding an antirheumatic substance potentially more available and less costly than cortisone, we and others have studied the effects of certain adrenal extracts and several steroids related chemically to cortisone.

Compound F of Kendall* (17-hydroxycorticosterone), which is much rarer than cortisone, appears to have antirheumatic properties comparable to those of cortisone. Our experience with compound F in a few cases of rheumatoid arthritis will be reported elsewhere. A specially prepared and highly concentrated extract of adrenal cortex, containing a mixture of compounds E (cortisone) and F, exhibited marked antirheumatic properties when given orally to 1 rheumatoid patient. This and other data suggested that cortisone (and perhaps also compound F) might be effective when given orally. The preliminary results of Freyberg and of ourselves from the oral administration of cortisone have been announced and will be reported elsewhere (20).

Eleven other steroids, more or less closely related chemically to cortisone, have produced no significant effects in our cases of rheumatoid

*For the compound F and for this special extract we are indebted to Drs. Gifford Upjohn and H. F. Hailman, The Upjohn Company.

arthritis (21). These included Δ^5- pregnenolone and 21-acetoxy pregnenolene.*

OPTIMAL METHODS OF ADMINISTRATION OF CORTISONE OR ACTH

The optimal dosages and method of administration of cortisone and ACTH remain to be determined and may not be established clearly without more information about the physiology and metabolism of cortisone, compound F and ACTH.

For rheumatoid patients three main methods of administration are being investigated (9, 22, 23): (1) intermittent courses of either hormone, (2) more or less continuous administration and (3) alternate courses.

In the first plan the hormone is given daily for about four to six weeks or until symptoms and signs of the disease have been largely controlled. Then administration is discontinued until the disease has relapsed sufficiently to make reinstitution of hormonal usage desirable.

In the second plan either hormone is given daily, at first in fairly large suppressive doses, later in progressively smaller maintenance doses. In some cases satisfactory clinical control can be accomplished by maintenance doses of 50 to 75 mg. daily, or about 100 mg. on each Monday and Wednesday and 100 or 200 mg. on each Friday.

In the third plan a course of cortisone is followed by a rest period, then later a course of ACTH and so on. This has certain theoretical advantages but results therefrom in a significant number of cases are not yet available.

Several variants of these programs are under study.

In order to develop a practical method of administration of these hormones in chronic conditions responsive thereto, it seems important to keep in mind this policy: in the presence of functioning adrenal glands one must learn how to co-operate with them rather than to dominate them or to try to take over their functions.

*Sold commercially also as natolone or artisone.

COMMENT

Until more data are at hand cortisone and ACTH are being used by us, not as established forms of treatment, but as useful new tools for the clinical investigation of a group of diseases which heretofore has been peculiarly resistant to inquiry.

For the management of certain acute conditions requiring relatively short-term usage of these hormones current methods of administration might already be said to be satisfactory. For the management of chronic conditions requiring long-term usage of the hormones improved and satisfactory methods of administration will, we believe, be developed.

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Blood Flow and Metabolism of the Human Brain in Health and Disease*

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RECENT years have witnessed an expanding interest in clinical physiology, stimulated, perhaps, by the application of mathematical and physical sciences in the development of indirect approaches to hitherto inaccessible areas of human function and disease. Measurement of peripheral blood flow, of cardiac output, of renal circulation and glomerular filtration rate were successfully achieved in man more than a decade ago at a time when quantitative information on the cerebral circulation had not been obtained even in lower animals. It was not until 1943 that such measurements were made by Dumke and Schmidt (2) in the rhesus monkey, a species whose cerebral circulation resembles that of man in being readily isolated from the extra cerebral blood supply to the head. An ingenious bubble flow meter interposed in the arterial supply to the brain yielded quantitative estimates of total cerebral blood flow.

In man so direct a procedure was out of the question. It was thought possible, however, that the Fick Principle which forms the basis of cardiac output and renal blood flow measurement, could be modified and successfully applied to the cerebral circulation. This principle states that if one can measure the quantity (Q) of some substance taken up by an organ from the blood and, during the same time, the difference in concentration of that substance in the blood entering and leaving that organ (A − V), then one can calculate the rate of blood flow through that organ simply as the ratio between those quantities or,

$$\text{Blood Flow} = \frac{Q}{A - V}.$$

Unfortunately, the brain, unlike the kidney, does not specifically and selectively remove foreign substances from the blood and excrete them for accurate measurement. Furthermore, although it does consume large quantities of oxygen, that consumption cannot independently be measured or even assumed to be constant since it would be expected to vary with activity and disease. The brain does, however, absorb by physical solution an inert gas such as nitrous oxide, which reaches it by way of the arterial blood. It was hoped that the quantity of this gas absorbed by the brain would be independent of the state of mental activity and susceptible of measurement on the basis of physical solubility alone. If this were found to be the case, then the numerator of a Fick equation applied to the brain could be derived.

Studies were begun on the solubility of nitrous oxide in blood and brain. It was eventually found (7) that the solubility of this gas was the same in brain as in blood and moreover that the solubility was the same in the brain of dog and man, in living brain and in dead brain and was unaffected by a variety of diseases. Experiments were designed to measure the uptake of nitrous oxide by the brains of dogs exposed to low concentrations of this gas for varying lengths of time. It was found that at the end of ten minutes the brain was essentially in equilibrium with the venous blood which drained it and therefore the nitrous oxide concentration in the inaccessible brain could be obtained from its concentration in readily accessible cerebral venous blood. This finding was confirmed in man with the use of radioactive inert gas, krypton, which permitted measurement of its concentration in living

* Thomas Dent Mütter Lecture LXIII, College of Physicians of Philadelphia, November 1, 1950.

human brain by means of an externally placed Geiger-Müller counter.

It was necessary now to derive the denominator of the Fick equation, or the arteriovenous difference in nitrous oxide concentration for the brain during this process of equilibration. More than a decade before (16), a technique had been devised for obtaining samples of venous blood from the brain by insertion of a needle into the superior bulb of the internal jugular vein at its point of emergence from the skull. Arterial blood samples could be obtained from the femoral or any other convenient artery. Such blood specimens, taken at intervals over a ten minute period of inhalation of 15% nitrous oxide were analyzed for this gas and

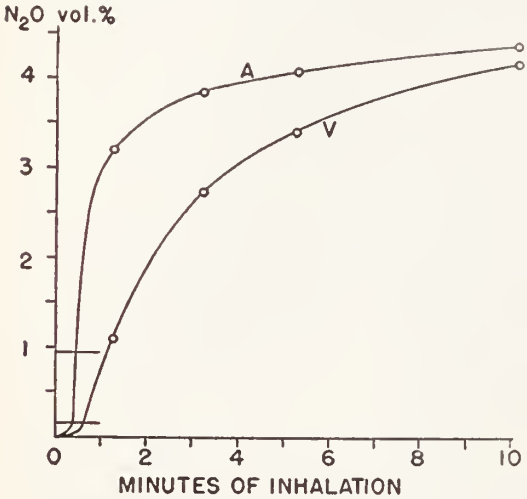

Fig. 1.

characteristic concentration curves were obtained (*Fig. 1*). It may be seen that the arteriovenous difference in concentration is not constant but variable, being initially rather large and decreasing progressively as equilibrium is approached. It was necessary to broaden the classical Fick principle, originally designed for a steady state of oxygen uptake, to a more general one embracing the uptake of inert gases by a tissue. This was accomplished by substituting elementary calculus for arithmetic and a new expression was derived (5):

$$\text{Blood Flow} = \frac{Q_u}{\int_0^u (A - V)dt}$$

The denominator of this expression is measured as the area between the arterial and venous curves over a period of time (u) equal to 10 minutes, while the numerator is equal to the concentration in cerebral venous blood at the end of that time. Since this represents not a total amount but a concentration of nitrous oxide (quantity per unit weight of brain), the values for flow thus obtained are in terms of flow per minute per unit weight of brain.

Before these values could be accepted as valid measures of cerebral circulation, it was necessary to determine to what extent blood samples obtained from one internal jugular vein were representative of mixed venous blood from the brain (1) and to what extent these samples were contaminated by blood arising from extracerebral regions such as the face and scalp. The first of these problems was attacked by simultaneous determinations employing the right and left internal jugular veins (12). It was found that there was no significant difference between the two sides and it was therefore concluded that cerebral venous blood is adequately mixed by the time it leaves the brain.

In order to determine to what extent blood from extracerebral regions is present in the internal jugular vein at the point of sampling, studies were performed at the operating table in cases where exposure of the carotid bifurcation was necessary. A small quantity of dye (Evan's blue) was injected into the external carotid artery while blood samples were taken from the internal and external jugular veins. By spectrophotometric analysis of these blood samples it was found that practically all of the injected dye appeared in the external jugular vein, only insignificant amounts of blood of external carotid and therefore extracerebral origin finding their way into the internal jugular samples (18).

As a final evaluation of the nitrous oxide method experiments were performed in monkeys in which cerebral blood flow was measured simultaneously by this method and directly by means of the bubble flow meter. An excellent correlation was found between the two methods

(11). The author of a new technique is usually the one most cognizant of its inadequacies and does his work a disservice should he neglect to mention them. The nitrous oxide technique has two important limitations. Since it requires a period of ten minutes for the determination of a single value for cerebral blood flow it is not applicable to the study of rapid changes in this function as are likely to occur in syncope or in convulsions. Further, since no generally applicable technique is at hand for obtaining venous blood from localized areas, the method yields only an average for the brain as a whole. There is as yet no method for studying the circulation and metabolism of parts of the human brain.

TABLE 1

CEREBRAL CIRCULATION AND METABOLISM

Normal Values in Healthy Young Men

	PER 100 GM. PER MIN.	FOR WHOLE BRAIN PER MIN.
Blood Flow	54 ml.	750 ml.
Vascular Resistance	1.6 units	0.115 units
Oxygen Consumption	3.3 ml.	46 ml.
Glucose Consumption	5.4 mg.	76 mg.
Respiratory Quotient	0.99	0.99

Measurement of cerebral blood flow is useful not only in itself but also because it permits the evaluation of two other and very important cerebral functions. One of these is cerebrovascular resistance, a measure of all the factors opposing the cerebral blood flow, most prominent of which is the tone of the vessels themselves. Most important of all, however, is the ability to calculate the rate of cerebral metabolism in terms of oxygen or glucose consumption or in fact the utilization or production by the brain of any substance which can accurately be detected in arterial and venous blood. Normal values for all of these functions obtained in a series of healthy young men (12) are presented in *Table 1*. In the first column are presented the data directly as obtained by the nitrous oxide method and in the second column the values for the whole brain assuming a normal weight of 1400 grams. The blood flow of the brain represents about one-sixth of the cardiac output and its oxygen consumption nearly one quarter of that of the entire body.

TABLE 2

PHYSIOLOGICAL AND PATHOLOGICAL STATES INVOLVING ALTERATIONS IN CEREBRO-VASCULAR RESISTANCE AND BLOOD FLOW

CONDITION	MEAN ARTERIAL BLOOD PRESSURE	CEREBRAL BLOOD FLOW	CEREBRAL O_2 CONSUMPTION	CEREBRO-VASCULAR RESISTANCE
	mm. Hg	*ml./100 g./min.*	*ml./100 g./min.*	$\frac{mm.\ Hg}{ml./100\ g./min.}$
Normal	85	54	3.3	1.6
Hyperventilation	98	34	3.7	2.9
CO_2 (5–7%)	93	93	3.3	1.1
O_2 (85–100%)	98	45	3.2	2.2
O_2 (10%)	78	73	3.2	1.1
Increased Intracranial Pressure	118	34	2.8	3.5
Primary Polycythemia	108	25	3.0	4.3
Anemia	78	79	3.3	1.0
Cerebral Arteriosclerosis	121	41	2.8	3.0
Cerebral Hemangioma	75	164	3.3	0.5
Essential Hypertension	159	54	3.4	3.0

The first application of the new method was to the problem of the effects on cerebral circulation of alterations in the oxygen and carbon dioxide tensions of arterial blood (13). The results (*Table 2*) confirm classical experiments on animals which demonstrated that carbon dioxide was a potent cerebral vasodilator as was anoxia, whereas high oxygen tensions and low carbon dioxide pressures produced mild and severe vasoconstriction respectively. Evidence was acquired in these studies to suggest

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that the dominant control of cerebral vessels in man was a chemical one, activated by levels of carbon dioxide, oxygen and hydrogen ion. A more recent study on the role of the cervical sympathetic supply to the brain (4) has cast further light on this question of the normal control of the cerebral circulation. It was found that procaine block of both stellate ganglia produced no change in cerebral circulation or resistance, which suggests that the known sympathetic channels to the brain do not exert an appreciable tonic effect on cerebral vessels.

Several diseases are associated with significant disturbances in cerebrovascular resistance or cerebral blood flow; some of these are listed in *Table 2*. Increase in intracranial pressure as a result of brain tumor (14) produces a progressive rise in cerebrovascular resistance undoubtedly as a result of external compression of the thin walled vessels of the brain. The cerebral blood flow, however, is not significantly compromised until cerebrospinal fluid pressure exceeds 400 mm. of water, a homeostasis achieved by a compensatory increase in blood pressure. Thus Cushing's classical experiments on dogs are completely confirmed by observations on man.

Cerebral arteriosclerosis is found to be associated with a marked increase in cerebrovascular resistance (3) probably the result of organic changes in the walls of blood vessels. This narrowing of cerebral vessels, long recognized at the autopsy table and now demonstrated during life is accompanied by a significant reduction in cerebral blood flow which may cause or certainly contribute to the mental deficiencies in this disease.

The findings in patients with essential hypertension (6) are of interest. There is practically a two-fold increase in cerebrovascular resistance which in the absence of significant changes in intracranial pressure or blood viscosity must be attributed to an actual constriction of these vessels. This change, however, is in exact proportion to the elevation in blood pressure with the result that cerebral blood flow is practically normal. These observations on cerebral vessels are similar to those of other investigators who have studied the vascular beds of the kidneys, extremities, and splanchnic viscera in this disease. The effects of a reduction in the high blood pressure to more normal values (8) are of importance in understanding the nature of the increased cerebrovascular tone and in determining the wisdom of reducing the blood pressure of hypertensive patients. After interruption of the sympathetic outflow to the trunk and lower extremities achieved either by procaine (8) or surgical sympathectomy (17) evidence is found of a relaxation of the abnormally increased cerebrovascular tone and a tendency to preserve a normal cerebral blood flow.

A number of disturbances in cerebral metabolism have been investigated by means of the nitrous oxide method (*Table 3*). Among the earliest of these studies was that on diabetic acidosis and coma (10). It was learned that the state of coma, contrary to the prevailing theory, is not the result of a deficient cerebral blood flow—in fact, this function is actually somewhat better than normal—but, rather, is associated with a significant reduction in cerebral oxygen utilization. This occurs in spite of an adequate supply of blood and oxygen to the brain and an oxyhemoglobin dissociation curve which favors the uptake of oxygen by the tissues. The evidence found suggests an intracellular defect possibly on the basis of acidosis or ketosis.

In the hypoglycemia and coma of insulin shock therapy may be seen the results of a fairly acute reduction in glucose available for cerebral utilization (9). In these patients there is a progressive decrease in cerebral oxygen and glucose consumption as the blood glucose concentration falls. Blood pressure and cerebral blood flow are maintained within normal limits. In deep insulin coma there is evidence that the brain utilizes its own carbohydrate stores at a rate which would exhaust them in approximately ninety minutes. This corresponds to the length of time during which insulin coma may be maintained without the production of irreversible cerebral damage.

In surgical anesthesia produced by thiopen-

tal there was found a marked reduction in oxygen consumption by the brain in spite of adequate blood oxygen saturation and a somewhat elevated cerebral blood flow (20). This depression in cerebral metabolism is probably the result of an interference with intracellular enzyme systems.

A surprising result was recently uncovered when it was learned that cerebral oxygen utilization in hyperthyroidism was not increased above the normal level in spite of a marked increase in oxygen consumption by the body as a whole (19). This interesting finding is the first suggestion that thyrotoxicosis may not represent a generalized acceleration in metabolism of all body cells, for one important organ at least appears to be unaffected.

A fascinating domain on which this technique may throw some light is the important relationship between the mind and cerebral metabolism. In at least one type of psychosis, senile dementia, there is reasonable evidence that the changes in mental state result from demonstrable deficiencies in cerebral blood flow and metabolism (3). In schizophrenia, on the other hand, no deviations from the normal were found in any of these functions (15), suggesting either that schizophrenia is not a disease of the brain or, if it is, that the changes in cerebral metabolism are so subtle or localized as to escape detection by this technique.

In general, however, there is a definite relationship between gross changes in mental state and cerebral oxygen consumption. If a large series of random observations are separated into three groups on the basis of levels of awareness: alert, confused, and comatose, the mean values for cerebral oxygen consumption are found to be 3.3, 2.8, and 2.0 ml. of O_2 per 100 gm. of brain per minute, respectively. These significant differences in cerebral metabolism associated with different levels of consciousness represent the beginning of an approach to the understanding of the mind through a study of the biochemical changes in the brain.

TABLE 3

CONDITIONS INVOLVING ALTERATIONS IN MENTAL STATE OR CEREBRAL METABOLISM

CONDITION	MENTAL STATE	MEAN ARTERIAL BLOOD PRESSURE	CEREBRAL BLOOD FLOW	CEREBRAL O_2 CONSUMPTION	CEREBRO-VASCULAR RESISTANCE
		mm. Hg	*ml./100 g./min.*	*ml./100 g./min.*	$\frac{mm.\ Hg}{ml./100\ g./min.}$
Normal	Alert	85	54	3.3	1.6
Schizophrenics	Alert—inaccessible	95	54	3.3	1.7
Schizophrenics, Narcosynthesis	Alert—more accessible	95	54	3.3	1.8
Cerebral arteriosclerosis	Confused	121	41	2.8	3.0
Diabetic acidosis	Confused	86	45	2.7	2.1
Insulin hypoglycemia	Confused	86	61	2.6	1.4
Brain tumor	Comatose	122	34	2.5	3.6
Pentothal anesthesia	Comatose	78	60	2.1	1.3
Insulin coma	Comatose	93	63	1.9	1.5
Diabetic coma	Comatose	66	65	1.7	1.1

This discussion has been necessarily limited to the work of a single group of investigators. The same technique has, however, been applied by other workers to many other aspects of cerebral physiology and disease. The accumulated knowledge as yet is modest indeed and the practical results negligible; we may hope, however, as our understanding of the fundamental derangements in human disease increases, that rational therapy will not be long delayed.

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Memoir of George Richards Minot*

By EDWARD B. KRUMBHAAR

GEORGE RICHARDS MINOT (Harvard A.B., M.D., and S.D.), one of seven American Honorary Fellows of this College, died at his home in Boston on February 25, 1950, in his 65th year.

Dr. Minot will be longest remembered, of course, for the demonstration that patients suffering from pernicious anemia could be maintained in a good state of health indefinitely by consuming large quantities of liver. The great importance of this study was so obvious that when the results were summarized at the meeting of the Association of American Physicians in May, 1926, the large audience rose and cheered long and loud. The evidence was quickly accepted, though it was not till 1934 that Minot and his assistant, W. P. Murphy, were given the Nobel prize for medicine jointly with Dr. George Whipple, the first Americans to win the Nobel prize for Physiology and Medicine. Whipple had stressed the importance of faulty development of the erythrocytic stroma in pernicious anemia, and had demonstrated the importance of liver and muscle meat diets in experimentally produced hemorrhagic anemia. Minot's was perhaps the last great medical discovery to be made by the simple and time-proved methods of careful history taking, physical examination and continued close observations, augmented by a few simple laboratory tests. These studies did much to divert hematology from the increasingly barren field of minute morphologic blood cell details into the more fertile functional study of the hemolytopoietic system which is now being so profitably cultivated. From the beginning of his work Minot, like Pepper (1875) and Cohnheim (1876), looked on pernicious anemia as primarily a disease of blood formation, as opposed to the hemolytic view then current. He soon began to link it with dietary deficiencies, a reflection of what was to be his chief lifelong interest—diseases of the blood and deficiencies in nutrition.

As Minot puts it in the modest closing words of his Nobel prize address: "It seems to me that one may expect in the future more information to be obtained which, directly or indirectly, will follow as a result of these observations. Thus, upon the foundations laid by previous investigators, do medicine, arts, and sciences build a structure which will in its turn be the foundation of future knowledge."

Dr. Minot was born in Boston, December 2, 1885, into a distinguished medical family. His father, James Jackson Minot, was a good teacher of clinical medicine at the bedside. His great-uncle, Francis Minot, was for sixteen years Professor of Medicine at Harvard; and his cousin, Charles Sedgwick Minot, the distinguished anatomist, was Professor of Histology there. His grandmother, Harriet, was the daughter of James Jackson, the eminent clinician who was the moving spirit in developing Harvard medicine and was one of the chief founders of the Massachusetts General Hospital and of the *New England Journal of Medicine*. Philadelphia is the only other city in this country that could furnish such a medical family tradition.

George Minot graduated from Harvard College in 1908, and from the Medical School in 1912 (both *cum laude*), and received an honorary S.D. from his Alma Mater in 1928. Other biographical data, including twelve honorary awards and twenty-five memberships (thirteen of which were honorary) may be found in the Anniversary Volume (Symposium on Hematology) published by Grune & Stratton in 1949. Stricken by a severe diabetes mellitus in October, 1921, Dr. Minot was one of the first (early in 1923) to profit by the

* Prepared at the request of the Council of the College of Physicians of Philadelphia.

newly discovered insulin. He continued to take it throughout life and one must recognize a poetic fitness in the concatenation that made possible his discovery of the liver treatment of pernicious anemia, thus converting an otherwise uniformly fatal disease into one that could be indefinitely controlled by proper therapy. However, in the quarter century of useful existence thus vouchsafed to him, his own self control and, still more, his devoted wife's ever-vigilant supervision of his daily diet and the many details of a busy life contributed with insulin as important factors.

After a year as House Officer at the Massachusetts General Hospital, and two years at Johns Hopkins as Assistant Resident Physician to Dr. Thayer and in the physiological laboratory with Dr. Howell, Dr. Minot returned to Boston to work from then on chiefly at the Massachusetts General Hospital and the Thorndike Memorial Laboratory. His earliest publication (with C. Frothingham) was submitted to the *Journal of Medical Research* the month of his graduation from the medical school. From then till his last article (his Hatfield lecture given at this College in February, 1947, was one of the latest) his publications appeared in a constant stream, almost all on hematology. Pernicious anemia first appeared in the title of a publication by him in 1914—a study of nitrogen metabolism before and after splenectomy in pernicious anemia—in the *Johns Hopkins Hospital Bulletin.*

Minot's contributions to hematology were not limited to pernicious anemia. Under Howell's stimulus, he early began to study the nature of blood coagulation, the blood platelets, hemophilia and similar problems, and reverted to them throughout his career. Hemophilia, for instance, was the subject of one of his last articles, published in 1947. His studies of the lymphomatoid diseases and the effects of irradiation on them, at the Huntingdon Hospital (1923–28), are still accepted as important landmarks. Handicapped by lack of a simple objective method for determining the state of erythrocyte regeneration, he early hit on the use of frequently repeated counts of the reticulocytes in the peripheral blood as a measure of the bone marrow response. From then on the percentage of "retics" has been the standard method of acquiring this information.

Personally, Dr. Minot exhibited a calm, kindly, modest, courteous, almost suave exterior, all the best elements of his ancestors' bedside manner, combined with their urge to help suffering humanity. A good companion, he enjoyed his friends, his hobbies and the amenities of life. His wife writes of his pleasure on seeing his Philadelphia friends when he gave the Hatfield lecture, his last away-from-home address, and how he loved the champagne and terrapin, a Weir Mitchell legacy, at the dinner beforehand.

Beneath this equanimity dwelt a pertinacious inquisitiveness, an abounding enthusiasm, and a lively imagination satisfied with nothing short of the best, from himself as from his staff, and a quiet courage that snatched victory from disaster. In the phrase of the minute of the Harvard Faculty of Medicine: "Generically . . . a Yankee of the Yankees, specifically . . . a proper Bostonian, . . . culturally an aristocrat, he was in behavior a democrat."

Sidney Burwell truly says in the Foreword to the Anniversary Volume: "He had been surrounded by tradition all his life, and in some ways his reactions and thinking are highly traditional, but this habit of mind is combined in an extraordinary linkage with an insatiable curiosity and an avidity for understanding that has driven his mind into new and startling regions of thought." He gathered near him those with a similar curiosity, and the hematologists scattered throughout this country bear witness to his ability to stimulate curiosity in others. When he gave his Nobel Prize lecture eight years after the discovery, the idea had already been considerably developed; to Minot, the careful clinician, this meant "the physician . . . must do more than prescribe the proper amount (of liver) . . . he should

attend to all aspects of the case and not neglect . . . the individual's problems of thought and action." It is not an exaggeration to place him, as did the writer of the obituary in the *Lancet* (March 4, 1950) "as one of the company of great physicians—Harvey, Jenner, Addison, Harvey Cushing, Thomas Lewis—whose work was the starting-point for a sudden leap forward in our understanding of disease." As Garrison said of Jenner: "Like Newton, Harvey, Sydenham, Darwin and Lister, he is one of the great men of purely Saxon genius, a happy combination of rare common sense with extreme simplicity of mind and character."

Memoir of Horace James Williams*

By LOUIS H. CLERF

IT IS with deep regret we record the passing of our late colleague, Dr. Horace James Williams, on June 3rd, 1950, at Lewes, Delaware.

Dr. Williams was born at Chincoteague, Virginia. He received his education at Dover Academy, Delaware, and at the University of Delaware. He was graduated from the Jefferson Medical College in 1912.

He served an internship at the Germantown Hospital and a residency at the Pennsylvania Hospital for Mental Diseases. His interest in otolaryngology earned an appointment on the service of Dr. S. MacCuen Smith at Germantown Hospital and he proved himself a worthy student of this illustrious teacher.

He later succeeded Dr. Smith at the Germantown Hospital and also became connected with the Philadelphia Hospital for Contagious Diseases which gave him an unusual opportunity to practice otologic surgery and he became one of the outstanding authorities in this field. He also headed the Departments of Otolaryngology at the Memorial and Jeanes Hospitals. He served two terms as Chief of Staff at the Germantown Hospital and he was civilian consultant to the Veterans Administration.

In the meantime he had given up his practice to serve in World War 1 as First Lieutenant. While serving as Assistant Professor of Otology at the University of Pennsylvania in 1937 he was invited to fill the chair of Otology at the Jefferson Medical College and to head the Department of Otology at the Jefferson Hospital.

He was a member of the Philadelphia Laryngological Society and served one term as its president. He was also a member of the American Otological Society, American Laryngological Association, American Laryngological, Rhinological and Otological Society, American Academy of Ophthalmology and Otolaryngology, College of Physicians of Philadelphia, American College of Surgeons, American Medical Association, Pennsylvania State Medical Society and the Philadelphia County Medical Society. His publications in his specialty were numerous.

Dr. Williams was a member of the Union League, the Philadelphia Country Club, the Germantown Cricket Club and the Philadelphia Art Alliance. He married Miss Hattie Bond in 1946, who survives him and he is also survived by a sister, Mrs. Thomas H. Fooks, of Georgetown, Delaware.

Dr. Williams was a man of fine appearance, of a friendly manner and enjoyed doing kindly things for his friends and for his patients. Throughout his professional career he found time to care for the otolaryngological problems of the orphans and aged at the Lutheran Orphans' Home and Asylum for the Aged in Germantown. His generosity here was evident not only in his medical and surgical contributions but also in his personal gifts of little luxuries that he was continuously sending to these unfortunates.

He enjoyed gracious living, was a genial host and lived surrounded by a multitude of friends, both in and out of the profession.

We regret Dr. Williams' passing as a great personal loss as well as the loss of an important figure in American Otology.

* Prepared at the request of the Council of the College of Physicians of Philadelphia.

The Moon, Werewolves, and Medicine

By WALTON BROOKS McDANIEL

Emeritus Professor of the Latin Language and Literature, University of Pennsylvania

FOR most of us the moon is merely a planet of extraordinary beauty which can make certain evenings which we have spent on the water or under the whispering palms of a tropical landscape, silvered by its rays, experiences never to be forgotten, a light in the sky to guide lovers to their trysts, that inspires poets to compose their most sentimental songs, and a heavenly body which provides an oath for Romeos in which no wise Juliet will ever put her trust. But a little grubbing by a prosy scholar will reveal the inconstant moon in some much less commendable roles. As Lord Byron, speaking with all the authority of his amatory experience, once put it: "The Devil's in the moon for mischief", and it is now to some of the mischief for which she has been responsible that I am inviting my readers' attention as I delve once more into the far past in order to connect it with the Italy of the present. For the sake of a good omen I begin my story with the immortal gods, as any old Roman might, and I take my first words from that immortal English bard who lived as intimately as perhaps any other in the favor of Phoebus Apollo.

"That orbed maiden, with white fire laden, whom mortals call the moon" was known to the Greeks as Artemis, to the Romans as Diana, sister of the sun-god Apollo. This much any elementary manual of mythology, simplifying the facts, would tell you, if you did not already know. But, through some of the weird developments of Hellenic fancy, chaste Dian is not always such a simple and exemplary maiden. She does not always figure in ancient literature as a friendly deity of light, a sort of female Apollo, whose companions were the lovely nymphs and her favorite occupation hunting. You are also told that while she was Greek Selene, Roman Luna, in the sky, and Artemis or Diana on the earth, she was that dreadful goddess Hecate in the world below. As mistress of Hell, she was the patroness of sorcery. She it was who made the black art work. Witch and wizard worshipped her at the crossroads, so that in addition to bearing the epithet Triformis because of her triple aspect and character, she is often addressed as Trivia, goddess of the place where three ways come together. It is there that her devotees would summon spirits from the infernal regions and perform magic operations of a blood-curdling sort. Diana of the Crossways was Hecate, Queen of the Ghosts. Her appearance among men was heralded by the yelping of her hell-hounds. These were proper companions for her, since, as everybody must know, dogs even now see the spirits of the departed when they may be quite invisible to the human eye, and a dog is truly dumb if it is not sufficiently excited by the rays of a full moon to bay at it loud enough to awaken the very dead. In wild parts of Greece where animals have not been so fully christianized as with us I have heard the dogs calling to Hecate and her pack at all hours of a moonlit night and have cursed them into Hecate's abode in vain.

People in Roman times had no difficulty in believing that the moon, directly or indirectly, could greatly affect the health and material prosperity of man.[1] They were well aware that it influenced the rise and fall of the tides, even though the accounts that their pundits give of what the waters do and why they do it need amendment by a modern scientist. The mysterious relation between moon and tide

[1] Before we make merry over the absurdities in the following pages we should read such collections as that of Fanny D. Bergen, *Current Superstitions Collected from the Oral Traditions of English Speaking Folk*; see esp. 120–122, numbers 1111–1140.

would have been enough in itself to make an ancient thinker suspect that the planet must exercise occult powers over many other things. Already we come upon that seemingly imperishable belief which had the support of no less an authority than Aristotle himself, that life leaves the dying during the ebbing of the nearest tidal waters.[2]

Roman farmers paid close attention to the changes of the moon. The time to fell timber and to cut, gather, and store all vegetable products was while its orb was on the wane.[3] Manure was not to be touched except at that season.[4] On the other hand, the crops were thought to grow more vigorously as the moon increased.[5] That is the period during which a graft should be inserted.[6] I find that Italian agriculturists cherish many similar ideas and practices.[7] In what land, indeed, and in what Farmers' Almanac will one not discover them?

The changes of the moon were to be scrupulously observed in the raising of animals. Gelding should be done at the time it was on the wane.[8] Both the planet and the beast were losing something. On the other hand, one should put eggs under a hen at the new moon if they were to mature into a good brood of chicks.[9] We are advised that, if meat be salted while the orb is waning, no worms will ever invade it.[10] Shell-fish were said to increase and diminish in plumpness under the influence of the moon.[11] This is still a Sicilian belief.[12] Then there is that bit of zoological lore that the sea calf is so sensitive to the tides that the hair on its skin stands erect at the ebbing of the sea, even when the skin has been removed from the body.[13]

Man also was thought to be affected by this all powerful planet.[14] It is when it is full that a newborn child is in the greatest danger.[15] According to instructions that the polymath Varro has left us, not only the wool of sheep, but the hair of man should be cut while the moon is waxing. Failure to observe this precept would make at least the human being bald.[16] It was the phase of the moon and not alone the length of his locks that made Emperor Tiberius call in his barber and, no doubt, his faith in astrology tyrannized over him in other particulars of his private life.[17] We learn from Italian folklore of today that clipping the hair when there is no moon stays its growth, but, when it is waxing, makes it grow more luxuriantly.[18] Actual exposure to its beams is said to

[2] Plin. *N.H.* (hereafter abbreviated *N.H.*) 2.20. For modern times we may refer to C. J. S. Thompson, *The Hand of Destiny, The Folklore and Superstitions of Everyday Life*, 177–178; F. D. Bergen, *op. cit.*, 126, no. 1184; *Notes and Queries*, Ser. 1, VI (1852), 311. In our day we find plenty of similar ideas current: cf., e.g., *Notes and Queries*, Ser. 5, I (1874), 44. If the tide is rising at the time of a birth, the issue will be a boy: Ser. 2, VI (1864), 69. For other superstitions about the tide: Ser. 4, IX (1872), 297.

[3] Cat. *De Agric.* 37.3; Varr. *R.R.* 1.37.1; Plin. *N.H.* 16. 193–194; 18.321; Pallad. *R.R.* 1.34.8.

[4] *N.H.* 18.322.

[5] *N.H.* 18.308; Gell. 20.8.

[6] *N.H.* 17.108.

[7] Cf., e.g., G. Calvia, "Astrologia e meteorologia popolare sarda e specialmente del Logudoro", *Archivio per lo studio delle tradizioni popolari* (henceforth abbreviated *Archivio*), XV (1896), 33–34. For some interesting modern illustrations see *Notes and Queries*, Ser. 4, VIII (1871), 505; IX (1872), 24; Ser. 9, IX (1902), 32; Ser. 11, II (1910), 504.

[8] *N.H.* 18.322.

[9] *N.H.* 10.152; 18.322.

[10] *N.H.* 28.264.

[11] Lucil, 1222 (Edit. of Warmington); Hor. *Sat.* 2.4.30, Plin. *N.H.* 2.109; 2.221; Gell. 20.8.3–4 (quoting Lucil.); Pallad. *R.R.* 13.6.

[12] G. Pitrè "Meteorologia popolare siciliana", *Archivio*, IV, (1885), 503.

[13] *N.H.* 9.42.

[14] *N.H.* 2.221.

[15] *N.H.* 7.42.

[16] Varr. *R.R.* 1.37.2 This belief is current in parts of the U.S.: E. M. Fogel, *Beliefs and Superstitions of the Pennsylvania Germans*, 341, no. 1820; 342, no. 1826; 343, no. 1832; for England cf. *Notes and Queries*, Ser. 5, I. (1874), 44; for Iceland, Ser. 4, IX (1872), 297.

[17] *N.H.* 16.194: cf. 28.28.

[18] G. Bastanzi, "Superstizioni religiose nelle provincie di Treviso e di Belluno", *Archivio per l'antropologia e la etnologia*, XVIII (1887), 283; A. Karusio, "Pregiudizi popolari putignanesi (Bari)", *op. cit.*, 329; G. Siciliano, "Credenze ed usi popolari toscani", *Archivio*, I (1882), 432; A. Trombatore, *Folklore catanese*, 46; G. Pitrè, *Medicina popolare siciliana*, 236–237; G.

cause the head to ache and the hair on it to fall out.[19] They are a real menace to the functioning of the brain.[20]

It is to the moon that a woman of Naples who would increase the size of her breast repeats nine times the incantation: Santa Luna, Santa Stella, fammi crescere questa mammella, "Holy moon, holy star, make this breast grow for me." If she would perform this operation of magic with any hope of success, she has to be alone and quite naked. Furthermore, the well-known inability of heavenly powers to recognize that they are being addressed requires her to hold up her hands in obvious petitioning to the moon. Simple nudity itself can be so easily misinterpreted. The further inability of the powers to take in readily and precisely the purpose of a prayer makes her press her breast as she says *questa*, and makes her reinforce this deictic gesture by repeating the whole business those nine several times.[21] All this sort of precision was just as sound and necessary procedure in ancient Roman ritual as it is in modern magic ceremony. There must be no slip in the performance of it. Whether it now actually does beautify Neapolitan damsels I have not been privileged to know either by my sight or through the personal assurance of any flat-breasted *damigella*, but that even a nine-time repetition of a charm or prayer can sometimes fail to win its user an unalloyed success, we are presently going to learn from no less an authority than lovelorn Tibullus, who was a very pious and prayerful poet.

The Romans believed that such conditions in man as the quantity of blood in his veins, and his diseases, and also the diseases of animals were affected by the phases of the moon.[22] Its changes lessened or increased the value of mice as remedies.[23] For equally questionable reasons such herbs as are to be used as magic curatives are best gathered under its light at just the proper time.[24] In view of the influences on health that were accredited to the moon and the moon-controlled tides, it was entirely natural that on occasions of illness Diana should be one of the deities to receive prayers and sacrifices from the suppliant and from his anxious friends. And so it was that Tibullus, wearing a ceremonial fillet, and with his tunic ungirdled, as religious ritual required, made his nine vows to Trivia in the silence of night that his sweetheart Delia might get well. What is more, he assures us that he faithfully paid the vows which he made in his prayers. Delia did recover, but she lived only to be faithless to him in the arms of his rival. Bitterly the poet notes that her favored lover is profiting by the efficacy of the supplications that he made.[25]

Most of the ideas about the moon that I have been reviewing would strike many a modern Italian as quite reasonable, and they are readily exemplified in their folklore. For instance, a neuralgic pain about the eye-socket (*il dolore neuralgico soprorbitale*) is termed *chiodo lunare*, moon-stroke, because it begins with the rising of the moon and it disappears as it sets.[26] Diseases of the skin are thought

B. Corsi, "Usi, costumi, credenze e pregiudizi del popolo senese", *Archivio*, XIV (1895), 85; G. Calvia, *loc. cit.* (See note 7); Z. Zanetti, *La medicina delle nostre donne* (hereafter abbreviated *La medicina*), 235. Superstitions about the time to cut things are readily exemplified from our own country. For example, corns should be trimmed as the moon wanes: E. M. Fogel, *op. cit.* (See note 16), 242, no. 1254; 286, no. 1511.

[19] A. Balladoro, "Alcune credenze e superstizioni del popolo veronese," *Archivio*, XVIII (1899), 124.

[20] Those in bed with mental troubles are naturally made more restless by the light from a brilliant moon so that it is easy for untutored people to believe that the rays worsen insanity.

[21] J. B. Andrews, "Quelques croyances et usages neapolitains," *Archivio*, XVIII (1899), 33.

[22] Cf., e. g., *N.H.* 2.110; 2.221; Macrob. *Sat.* 1.17.11; 1.20 1.

[23] *N.H.* 29.59.

[24] Cf., e.g., Verg. *Aen.* 4.513; Hor. *Sat.* 1.8.20–22; Plin. *N.H.* 24.12.

[25] Tib. 1.5.15–18.

[26] Cf. Z. Zanetti, *La medicina*, 7. Sometimes it is termed *chiodo solare*, and is said to follow the circuit of the sun, *op. cit.*, 77. On the maleficent effect of the moon on man and animals: G. Pitrè, *op. cit.* (see note 12), 502. In Psalms 121.6 we read: The sun shall not smite thee by day nor the moon by night.

to grow worse as the moon waxes, better as it wanes, swellings to increase and decrease with it.[27] Italian folklore attributes other ills to moonbeams. They can give a person a twisted mouth, spoil his temper, bring on a headache, or even blind him. They may cause a woman's hair to fall out.[28] We need not cite here all the Roman parallels for what has gone before, but merely recall that ancient belief that the time of the full moon was most dangerous to newborn babies as we note an Italian superstition that the moon has a special influence over anybody who is born on a Monday, the day of the moon.[29]

Much of what we have been setting forth must appear to my readers so crazy that the adjective lunatic, which comes from *luna*, the Latin word for moon, will seem to him quite applicable to those who believed in it.[30] Any good dictionary will tell us that "lunatic" and "lunacy" referred originally to a sort of insanity that is interrupted by lucid intervals, which come, so it was supposed, in accordance with changes in the phases of the moon. From the same source we may further learn that "moonblink" means a temporary blindness or impairment of vision which is popularly attributed to sleeping under the direct rays of the moon, and that a person who suffers from it may be called "moon-eyed."

Behind all this there is a rich classical tradition. In the early fifth century of our era Macrobius, who was probably a Greek but wrote a curious work in Latin, tells us that women afflicted with certain diseases were said to be moon-struck or shot by Artemis.[31] Mention of the sex of the diseased as female might seem to point to hysterics, but, long earlier than this, the Latin term for "moon-struck" or "crazy", *lunaticus*, was used specifically of victims of epilepsy. When applied to *oculus*, "the eye," it referred to its blindness in moonlight. Those who are familiar with the Bible will think at once of that story in the New Testament[32] concerning the man who, when he failed to get his son cured by the disciples of Jesus brought him to the Master. This youth was what the Latin Vulgate terms *lunaticus*. He fell frequently into the fire or into water. Jesus diagnosed the case as one of possession by a devil, *daemonius*, rebuked the evil spirit, caused it to leave, and thus achieved an immediate cure. Nowadays a specialist might declare such a boy an epileptic and never even suspect the presence of a devil in him. But many an Italian priest still resorts to exorcism in such cases and thereby brings relief to at least the victim's solicitous friends.[33]

In view of the loose popular use today of various terms that describe victims of mental disorders, we need feel no surprise at any similar confusion in the terminology of two thousand years ago. Romans recognized that anyone who incurred the wrath of Diana might go mad.[34] The madness that is our immediate concern is that which makes a man imagine that he has become an animal, more especially a wolf, and causes him to behave like one. About this sort of mental aberration we have some entertaining information from all ages of history.[35] We must, however, bear in mind that at any period of history and anywhere

[27] Z. Zanetti, *La medicina*, 7.91; 231. A wen is said to decrease with the moon if the proper charm be said over it: A. Renda, "Medicina popolare in Calabria", *Rivista delle tradizioni popolari italiane*, II (1893–1894) 290.

[28] A. Balladoro, *loc. cit.* (see note 19). In particular a baby may be blinded by moonlight: cf., e.g., Z. Zanetti, *La medicina*, 139. On distortion of the features: E. M. Fogel, *op. cit.* (see note 16), 244. no. 1261.

[29] Z. Zanetti, *La medicina*, 7; 129, note 1: they grow up to be *lunatici*.

[30] The belief that the moon makes people "loony" has to be considered by Morris Fishbein in his book *Shattering Health Superstitions*, 34–37, as also the common idea that illness is affected by the moon's phases: 216–219. These are far-flung superstitions now. For the former cf., e.g., E. M. Fogel, *op. cit* (see note 16), 242, no. 1253.

[31] Macrob. *Sat.* 1.17.11.

[32] Math. 17.15–18; cf. 4.24.

[33] Z. Zanetti, *La medicina*, 10.84–85, in connection with which every Hellenist should read Lucian, *Philopseud.* 16.

[34] Cf., e.g., Horace, *Ars Poet.* 453–456.

[35] See on this and werewolfery in general M. Summers, *The Werewolf*, especially 2. He believes it a demoniacal possession: 23: 112!

in the world, just as soon as such transformations are widely credited and widely discussed, there will be numerous unstable persons to provide new cases of delusion and hallucination. In the Middle Ages many believed in the possibility of metamorphoses into animals. Consequently, lycanthropy was then a common enough disease. Sporadically in recent years the press has reported cases of children who have been carried off by animals, and suckled and reared by them. A wolf is often the foster-mother. When found, the fosterling may bear a strong resemblance to its forest mates. Why then not have sufficient faith to believe in man-wolves, men who become wolves by magic metamorphosis?

The wolf is an uncanny beast. We recall how Romulus and Remus were nursed by one of them and took in enough of the wolverine in their foster-mother's milk to affect their descendants for many a generation after Romulus slew Remus, as Cain Abel, and was himself translated to heaven to be a Roman deity, Quirinus by name, be it noted, a name which was often an epithet of Mars in his aspect of a god of war.

Among both the Greeks and the Romans the wolf ranked high among the animals that belonged to the zoology of witchcraft. Its body provided parts and organs that served as potent charms in all the weird operations of witch and warlock. Those who are familiar with Shakespeare's *Macbeth* and remember that the witches' cauldron contained in its hell-broth not only the fillet of a fenny snake and the "scale of dragon", but also the "tooth of wolf"[36] will read with interest Horace's account of the nocturnal rites of the witches Canidia and Sagana, who, in order to nullify the power of such magic things, stealthily conceal in the earth the beard of a wolf along with the fang of a spotted snake.[37] Then we recall that, when in the *Metamorphoses* of Ovid,[38] Medea brews the potion with which to rejuvenate the utterly senile Aeson, she puts in the pot, along with her potent herbs and with parts of such long-lived animals as the crow and stag, the entrails of a werewolf, a monster which, he assures us, can change its features of a wild beast into those of a man. Her magic liquor reduces the age of Aeson by forty years. Those were the days when merely eating rejuvenating organs would work, and there seems to have been no relapse to senility after a spell of lusty youth.

When we turn to Lucan's *Pharsalia*, we learn from some of the most emotional and imaginative poetry that has come down to us how Sextus Pompey, the unworthy son of Pompey the Great, wished to know in advance the outcome of the decisive contest which his father and Julius Caesar were soon to enter. With calculating wickedness he resorted, not to the sources of oracular knowledge that were orthodox in his day, but to the mysterious agencies of sorcery. Erictho, the worst of all the Thessalian witches, lent him her aid. Whenever she needed parts of the unburied dead in order to carry out her deviltries, she would wait until some wolf was rending a corpse and then snatch from its dry throat the relics that would achieve her will. It is from the jaws of such uncanny beasts that she yearns eventually to seize even the limbs of Caesar and of Pompey.[39]

In ancient Italy the mere gaze of a wolf was thought to be noxious.[40] It was an animal that was possessed of the power of the "evil eye," if there ever was one. There are Italians who believe that, if it fastens its eye on a child, he cannot run and so is easily seized and devoured. Fortunately, he need only hold his cap or anything else that is made of wool between his lips and teeth and that nullifies the beast's power to fascinate.[41]

The important status of the wolf in the black art is attested by much lore which the Natural History of Pliny preserves. In order to protect farmhouses against enchantments

[36] Shakespeare, *Macbeth*, IV. 1.12–21.

[37] Hor. *Sat.* 1.8.42–43.

[38] Ovid, *Met.* 7.268–274.

[39] Lucan 6.550–553.

[40] *N.H.* 8.80.

[41] S. Raccuglia, "Medicina popolare siciliana", *Rivista delle tradizioni popolari italiane*, I (1893–94), 728.

or other nefarious magic, superstitious Romans would attach to their doors the dried muzzle of a wolf.[42] The skin of the animal's neck could also be employed in the same fashion, provided it was kept whole.[42] A newly-wedded wife anointed the doorposts of her husband's house with the fat of a wolf as a prophylactic, some said, against the entrance of any evil drug or potion, i.e., one of a magic sort.[43] When we find parts of the wolf recommended as remedies, we are pretty sure that they are expected to work mystically rather than in any way pharmacologically.[44] When women are near delivery, they can safeguard themselves, we are assured, against difficulty by eating the flesh of a wolf. If they are already in travail, somebody near them can do the eating for them.[44] Partaking of it will even counter any magic spell that may have been laid upon them. The catch here might seem to be the absence of wolf meat from the local market. We are gravely assured that, if an infant wears the tooth of a wolf as an amulet, it will be protected against fright and also against the ailments that accompany teething. The skin of the animal does that, too.[45] The larger teeth of a wolf, worn as a charm on a horse's neck, keep it from weariness.[45] A small lock of hair cut from the beast's tail was credited with aphrodisiac power, but it had to be taken from the animal while it was yet alive. No shed hairs, put together in a bunch, would work.[46]

According to ancient superstition, the wolf's mystic power was so great that a horse had only to tread on the tracks it left to be struck with torpor.[42] Elsewhere Pliny states that merely following the trail where a wolf has passed along would make a horse burst asunder beneath its rider. I might add that the liver of the beast was thought to resemble the hoof of a horse. This is a piece of information which may throw some light on these phenomena for my discerning reader.[47] No wonder that some believed that if a wolf saw a man first, it would instantly deprive him of all power of speech.[48] So Pliny reports. Then, in one of his rather rare fits of scepticism, he refuses to accept the story that some men have had the power to become wolves and afterwards revert to their human form. It is as a concession to vulgar opinion that he is willing to dwell on the matter as follows. According to a Greek author of no mean reputation, Euanthes, people in Arcadia in the Peloponnesus tell how a man belonging to the family of a certain Anthus is picked by lot and then conducted to a certain lake in that region. There he removes his garments and hangs them on an oak tree. Then he swims across to the other shore, goes into the desert and changes into a wolf. He associates with other animals of the same species during a period of nine years. If during all that time he has refrained from eating any human flesh, he returns to the lake, swims across, recovers his original form, having suffered no change except for the ageing which those nine years would naturally bring. He even gets back his old clothes.[49]

Next we have from our author the tale of the Parrhasian Demaenetus, who, having ventured to taste the entrails of a boy who had been sacrificed to Lycaean Zeus, was thereby turned into a wolf. In the tenth year thereafter he was restored to human form and won an Olympian victory as a champion boxer[50]—a quite comprehensible outcome of such a decade of wolfish life. But, after all, these are Greek tales, and the credulity of the imaginative Greeks was proverbial. Let us see what other Romans than Pliny have to say of similar metamorphoses.

Curiously enough, it is the relatively gentle poet Tibullus who tells us of a loathsome old bawd who under the poet's curse is to be harried by ghosts, forced to eat bloody meat, make gall her bitter drink, be starved into devouring the weeds of a graveyard and into gnawing the bones that wolves have left. So,

[42] *N.H.* 28.157.
[43] *N.H.* 28.142.
[44] *N.H.* 28.247.
[45] *N.H.* 28.257.
[46] *N.H.* 8.83.
[47] *N.H.* 28.263.
[48] Verg. *Ecl.* 9.53–54; *N.H.* 8.80.
[49] *N.H.* 8.81. August. *De Civ. Dei* 18.7.
[50] *N.H.* 8.82; August. *loc. cit.*

driven to the wolf-madness of lycanthropy, she will run howling through the towns with her loins all bare, in terror from a pack of savage hounds at her heels.[51] A pleasant picture this of Roman vengeance!

Another poet, Propertius, refers to a witch who can assume the form of the night-prowling wolf.[52] But it is the novelist Petronius who has left us in his *Satyricon* the most famous tale of a werewolf in all the classical era, and he makes it a man, not a woman, who undergoes the change. His account runs as follows.

One of the characters, Niceros, tells of a hair-raising experience which he had one night when a trip that his master had to make to Capua gave him his chance to visit a sweetheart who lived at some distance out of town. The slave took along with him a soldier who was a guest in the house, a man as "brave as hell." They had come to a point on the thoroughfare where it was bordered with the tombs of the dead, as the roads beyond the gates of any Roman city were likely to be. The hour was sometime around cockcrow, but the light of the moon was almost as bright as of the midday sun, when his mate stepped aside among the monuments. Niceros sat down to wait for him, singing and amusing himself by counting the tombstones. Looking back at his comrade, he saw that he stripped himself and put all his garments at the side of the road. An awful terror seized the slave as he gazed at the strange performance. The last breath of life all but left his nose. He stood like a dead man. But the soldier urinated so as to circle his clothes completely with water and then suddenly turned into a wolf. The circummicturition safeguarded the clothes. Without these he could not hope to regain his human form when he came back. Niceros assures his listeners that he is not joking, that the gift of no fortune in the world would tempt him to tell a lie. After the soldier had become a wolf, he began to howl like one and fled into the woods. Niceros at first scarcely knew where he was, but then went to pick up the man's clothes only to find that they had all turned to stone. Although he was in mortal alarm, he drew his sword and kept slashing shadows with it all the way until he reached his sweetheart's villa. As he entered he looked like a spectre and all but gave up the ghost. Sweat ran down his legs. His eyes were dead. Only with difficulty could he be brought back. His dear Melissa expressed surprise that he was out walking so late and said, "If you had come earlier, you might at least have been of some assistance. A wolf entered our place, worried all our sheep, and bled them like a butcher. But he didn't get the laugh on us even if he did escape; for our slave pierced his neck with a spear." Niceros left for home at daybreak, and on his way passed the place where the garments had been turned to stone. He now found nothing there but a pool of blood. When he reached the house, the soldier was lying in bed "like an ox" (however that may be), and a doctor was attending to a wound in his neck. Then he realized that the man was a turnskin, a *versipellis*, or werewolf, and he could never bring himself to taste bread with him afterwards, even, he said, should it cost him his life if he didn't.[53]

Let us now see what has been the harvest in modern Italy from these ancient seed-thoughts about the moon and lunacy, about wolves as beasts of magic, and about men as potential wolves. I suppose that the only reason why we cannot find in recent times as many instances of the use of parts of the wolf in mystic medicine as we can those of various domestic animals, is that the creature, whether alive or dead, would not ordinarily be available. Moreover, when one of them had been slain, such villagers as were superstitious might not be foresighted enough to lay in a store of wolverine charms or curatives against a day of need. I note, therefore, with interest that a Sicilian who has, shall we say, an atavistic faith in such remedies will seek relief for abdominal pains by rubbing his belly with

[51] Tib. 1.5.49–56.

[52] Prop. 4.5.13–14.

[53] Petron. 62. The term *versipellis* has been aptly applied to Jupiter because of his disguises as a lover: Plaut. *Amph.* 123; cf. *Bacch.* 658.

the skin, or a tooth, or a bit of the intestine of the beast.[54] When, however, we turn to moon-lore, we find much entertaining material for study.

According to Italian definition, a *lunatico* is a person who suffers alterations in his brain which correspond in time with the varying phases of the moon. He is said to have *mal di luna*, a moon-disease. Epilepsy is deemed by some a lunar ailment.[54A] If in a Calabrian village you should see somebody fall on the street, beat the air with his fists, his eyes starting out of his head, his mouth oozing foam, understand that it is all due to the moon. Diana is up to her old tricks. But magic now offers a very simple remedy: put a masculine key in the victim's hand and that will set him on his feet again.[55]

A belief in metamorphoses which have been brought about through some occult influence or by some magic contrivance has never, it would seem, died out entirely in Italy. Although, in general, the children there do not have any such faith in the existence of werewolves as possessed some of the Greeks and Romans and as lingers among many members of the Slavic people, susceptible youngsters who live in country districts can be scared by telling them that the *caniguasti* will get them, if they venture out into the dark.[56] It is not surprising, therefore, that enough of the scared children grow up to perpetuate the superstitious beliefs about such monsters.[57]

The *lupo mannaro* or *lepomene* is clearly a lineal descendant of the *versipellis* of Petronius' tale of horror. Benighted members of backward communities, even within our own time, have believed that man may be made so wolverine under the influence of the moon as to act like wolves and even suddenly to grow nails of great length like those of the animal's claws. Their hair may also resemble the shaggy hair of a wolf.[58] Italian writers on popular medicine recognize *licantropia* or *mal di luna* as either a form of epilepsy, or in some cases, of melancholia.[59] Victims of it are seized with convulsions, rush madly out of their houses, howl through the streets, and especially where two ways cut each other in the form of a cross. They scratch on house doors with their hands crooked like claws, and cast themselves on the ground to roll in the mud and dirt. They can even reach such a degree of fierceness as to rend anybody whom they meet. The next morning they return to their natural selves, though they are more or less mute and inert from their exhausting exertion of the long night.[60] Giuseppe Pitrè would identify that lunatic of the New Testament whom we have discussed, as one of the man-wolves.[61] According to Sicilian stories, such bestialized beings resemble a dog or a wolf, shun human society, haunt graveyards, disinterring corpses, and they bite and even devour people. Fortunately for those who see them near them werewolves have great difficulty in ascending any stairs or the stepped streets which are so usual in Italian hill towns: after they have surmounted only three steps, they are likely to tumble over. Accordingly, they regularly run in the middle of the road, and so mounting even the sidewalk can save a pedestrian from their attack.[62] Between seizures these unfortunates

[54] G. Pitrè, *Medicina*, 366.

[54A] Their convictions need no support from the Greeks or Romans, such as Lucian, *Toxaris*, 24.

[55] L. Di Pasquale, "Meteorologia, medicina e superstizione popolare in Calabria", *Archivio*, XI, 249; cf. "Medicina popolare basilicatese", *Archivio*, XVI, 51.

[56] Countess Evelyn Martinengo Cesaresco, *Lombard Studies*, 134–135; C. Grisanti, "Credenze, pregiudizi, superstizioni in Isnello", *Archivo* XVII (1898) 315.

[57] G. Zanazzo, *Usi, costumi e pregiudizi del popolo di Roma*, 69–70; L. Villari, *Here and There in Italy and Over the Border*, 161–162; A. Rumpelt, *Sicilien und die Sicilianer*,[2] 118–119; Norman Douglas, *Old Calabria*, 176; A. DeGubernatis, *Rivista delle tradizioni popolari italiane*, I (1893–1894), 282; 635; 728; II 39; G. Amalfi, *Tradizioni ed usi nella penisola sorrentina*, 86–87. See for Lucania that fine book by Carlo Levi *Christ Stopped at Eboli*, 112–113.

[58] S. Raccuglia, *loc. cit.* (see note 41).

[59] G. Pitrè, *Medicina*, 435; M. Pasquarelli "Medicina popolare basilicatese", *Archivio*, XVI (1897), 51; Encic. ital., s.v. "Licantropia."

[60] G. Grisanti, *op. cit.* (see note 56) 314.

[61] G. Pitrè, *Medicina*, 436.

[62] G. Pitrè, *op cit.* 437; S. Raccuglia, *loc. cit* (see note 41); C. Grisanti, *op. cit.*, (see note 56) 314; A. Trombatore, "Credenze e superstizioni popolari", *Rivista delle tradizioni popolari italiane*, I (1893–1894), 282.

may be recognized, we are told, by their pallid faces, hollow eyes, weak sight, and a dryness of tongue which is due to intense thirst.[63]

People believe that there are effective ways of relieving lycanthropists of their seizure; for example, any kindly disposed person who is a good shot can hit the *lupo mannaro* on the head with a missile hurled from an upper window, or from close quarters he can more bravely cut his flesh or even prick his forehead so as to make his blood flow—a mere drop is enough—and with that the wolfishness should pass out of him.[64]

Persons who have the hereditary tendency to become wolverine should beware of the light of the moon at all times. They must cover the face when they lie in bed, if at some time before morning they might be struck by its direct rays.[61] November nights are particularly to be feared. There are Sicilians who think that persons are made *allunati* when the moon is in its first quarter.[65]

Among the inhabitants of the Abruzzi region the man who knows that he is a werewolf is supposed to have sufficient warning of the coming seizure so that he can tell his family to keep away from him and can himself shut up his cattle and his watchdog, thus safeguarding his possessions and himself. He then induces his transformation of personality by pouring water in the dust and rolling in the mud which it makes. After howling so frightfully as sometimes to bring out all the wolves of the neighborhood, he can restore his natural self and habits by once more wallowing in the place he has wet.[66]

Werewolves are especially likely to be abroad during the nights that precede Christmas Day.[67] The worst seizures of all occur at crossroads on the Eve of the Nativity.[68] In order to prevent lycanthropists of either sex from spoiling the peace of this happy season of the year, white crosses which have served in the procession of Ascension Day are planted where roads meet.[69]

While, if we are to accept the beliefs of the *popolino*, lycanthropy may be the result of the influence of a full moon, or be inflicted upon one by some act of witchcraft, a person can also be the victim of it through the mere accident of birth. For, according to sound occult dogma current in many parts of Italy, a boy baby who is born at twelve o'clock on Christmas night or during the night of the Anniversary of Saint Paul (January 24–25), or who is conceived at the latter time, or in the night of the Annunciation, will grow up to be either a manwolf or a sorcerer. In the latter case, he will be able to handle snakes with impunity, cure their bites by applying his saliva, face werewolves and mad dogs unafraid, foretell the future, and do various other wonderful things. A girl who is born at one of those times will grow up to be a witch or werewolf.[70]

[63] Cf. G. Pitrè, *Medicina*, 435. The eyebrows of a manwolf meet, they say, but no reader of mine need take this too seriously after gazing in his looking-glass.

[64] A. D'Amato,"Folklore irpino", *Il folklore italiano*, I (1925), 86; Encic. ital. s.v. "Licantropia"; G. Finamore, "Tradizioni popolari abruzzesi", *Archivio*, III (1884), 219–220; G. Pitrè, *Medicina*, 437; S. Raccuglia, *loc. cit.* (see note 41); E. Canziani, *Through the Apennines and the Lands of the Abruzzi, Landscape and Peasant Life*, 14; A. Trombatore, op. cit. (see note 18), 17–21. Cf. I. Sanfilippo, "Il lupomannaro del Carmine", *Archivio*, XVII (1898), 273–274.

[65] G. Pitrè, *op. cit.* (see note 12), 502.

[66] E. Canziane, *op. cit.* (see note 64), 12; G. Finamore, *op. cit.* (see note 64), 220.

[67] A. D'Amato, *loc. cit.* (see note 64).

[68] Encic. ital., s.v. "Licantropia."

[69] E. Canziani, *loc. cit* (see note 64).

[70] M. Pasquarelli, *loc. cit* (see note 59); Contessa Fulvia Perotti de' Miani, "Credenze e superstizioni di Cassano Murge (Bari)", *Rivista*, I, 381; M. Pasquarelli, "Noterelle folkloriche per la Basilicata, *Rivista*, I, 635; A. D'Amato, *loc. cit.* (see note 64); Encic. ital. s.v. "Licantropia"; G. Finamore, *op. cit.* (see note 64), 219. Some add the night of Saint John or that of Saint Peter: E. Bonaventura, "Le streghe, credenze popolari pisane," *Riv. d. trad. pop. ital.*, I (1893–1894), 932. According to the folklore of Pennsylvania Germans, the child born on Christmas Day or on Good Friday grows up with ability to see spirits: E. M. Fogel, *op. cit.* (see note 16), 263, no. 1372. Greeks explain the doom of the Christmas baby as a punishment of their mother's sin of being so presumptuous as to conceive on the same day as the Virgin Mary: Ernest Jones, *Nightmare, Witches and Devils*, 115; 140. Under the Greek Church the belief ran that the child would become a vampire, under the Roman, a werewolf. It is commonly held that a werewolf becomes a vampire after death; 145; M. Summers, *op. cit.* (see note 35), 15.

When these unfortunate beings come to die, their bodies will not decay, as those of ordinary mortals must do.[71] Such parents as are anxious about the future of their Christmas baby can avert at least all possibility of a wolverine career by branding their darling with a hot coal: they make on the nape of his neck or on the sole of his foot the sign of the cross.[72]

As we bring our little essay to its close, we may hark back to that famous story of Romulus, the mythical founder of Rome, and permitting ourselves a little flight of fancy, connect with him by the thread of this account of lunar and wolverine superstitions, that arch destroyer of the greatness of modern Italy, Benito Mussolini. My reader will recall how Romulus and his twin brother Remus were committed in some sort of floating basket to the slack waters of an inundation of the Tiber River to die by exposure, but were found by a mother-wolf who suckled them and licked them gently with her tongue. Faustulus, keeper of the royal herd of swine, rescued them from the wolf and gave them to his wife Larentia to bring up in their hut. But, according to one version of the Roman parallel for Moses and the ark of bulrushes story, the character of Larentia was far different from that of the daughter of Pharaoh who saved so compassionately the little Jew, far different, too, from that of Moses' mother, who by a shrewd contrivance became his nurse. Sceptics and gossips who found this Roman tale of a philanthropic wolf too supernatural to accept said that the only female that ever suckled the infants after their abandonment was Larentia herself, and that she, as being a woman who had prostituted her beauty for hire, had received from those who knew her character the nickname Lupa, or "She-wolf," a word that appears commonly enough in good Latin in the meaning courtesan, even as the derivative *lupanar* means a house of ill fame. And so we must make our choice between two animalistic nurses neither of whom would seem to promise a wholesome future for the twin foundlings who included that founder of Rome.[73]

Benito Mussolini was not the sort of Italian to escape the thrall of superstition. In his youth he enjoyed educational advantages in this line, being much under the influence of an elderly dame "la vecchia Giovanna", who passed for a witch. She provided her fellow-villagers with their magic and religious charms, their love philtres, and their quack medicines. The Duce's most intimate biographer, M. G. Sarfatti, who, if reports run true, enjoyed more favorable opportunities than moral rights to learn his bedtime fancies, tells of his aversion to having the light of the moon strike him as he slept.[74] She likewise discloses that, though priest-bred, he showed no passion for celibacy when women were about. As I contrast the facial appearance of the man whom I saw in his prime, when he was the arrogant idol of fascists of both sexes, with the were-wolverine features that all his more recent pictures reveal, I sometimes wonder whether the moon, in spite of any warnings from old Giovanna, did not work on him some of its magic mutations. I am well aware of the more usual diagnosis of both friend and foe that some *lupa* Larentia was somewhat responsible for his ailments. True to his past life, it was with such a woman as his companion that he met the most ignominious death that ever befell a great leader and passed, as any old Roman would believe, into the realms of Hecate, an arrival long overdue.

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Miami 33, Florida

[71] La Marchesa Di Villamarina, "Credenze e superstizioni popolari. Credenze popolari della Valsesia", *Revista*, I (1893–1894), 71).

[72] Encic. ital., *loc. cit.*; E. Bonaventura, *loc. cit.* (see note 70), speaks of the rites used.

[73] Dion, Hal. 1.79.4–10; 1.81.4; 1.82.2–6; 1.84.1–4; Liv. 1.4.3–7.

[74] M. G. Sarfatti, *Life of Benito Mussolini*, 59–60.

TRANSACTIONS & STUDIES

of the

College of Physicians of Philadelphia

Volume 18 (Fourth Series)

Number 4 (February 1951)

President's Address

By T. GRIER MILLER

IN MY previous annual address, covering the first year of the current administration, special emphasis was placed on the immediate physical and financial needs of the College and the tentative plans that had been developed for meeting them. Today, after another year, the 164th in the life of the College, I am glad to be able to report that some substantial progress has been made.

Building Fund

The most encouraging indication of ultimate success in the campaign for building funds lies in the loyal support of the Fellows themselves. They alone have already contributed approximately $55,000 and it is anticipated that the goal of $100,000 for the Fellows will be reached during the current year. Such generous support on their part is certain to influence favorably the lay public and philanthropic organizations, now about to be approached. Already, indeed, a number of significant donations have been made by non-medical friends of the College who, recognizing the importance of its public service, are manifesting real concern about the success of the project.

The original committee, appointed by President Schaeffer in 1948 to study needs and propose remedies, has completed its objectives, and now a new committee, designed to push the campaign for funds beyond the Fellowship of the College, has been appointed by the Council. This committee, like the former one, is under the chairmanship of the Vice-president of the College, Dr. Richard A. Kern. It already is actively at work and is being assisted by a highly experienced lay worker, made available to the College through the kindness of Mr. M. W. Clement, chairman of the Board of the Pennsylvania Railroad.

Budget

The College has continued, as always, to function within its budget, this being made possible by the increase in annual contributions of the Fellows, prescribed in 1949. Some further increase in income is anticipated for the current year from an increase in total fellowship. It is recognized that the qualifications for fellowship can under no circumstances be lowered, but investigation reveals that in the past many physicians, eminently worthy of Fellowship, have been overlooked. In this connection, incident to a timely suggestion from certain Fellows, the By-Laws have been revised to permit the election, as Associate Fellows and at one-half the customary contribution, of certain full-

time and highly qualified physicians of the city's medical schools.

Use of the College Hall

It will interest the Fellows to know that during the past year 110 meetings were held in the College halls, 71 of these by outside organizations. Among the latter was a meeting of the Congress of the Medical Women's International Association; another one, of the Numismatic Society of Philadelphia. In addition, another full-week post-graduate course, sponsored by the American College of Physicians, was held in the College building. These meetings brought to the College many persons who previously had known nothing of its history and attainments. Also, during the year 16 prominent lay guests were present at four dinners preceding regular meetings of the College, and all of these apparently became much interested in its activities.

The total attendance at the meetings in the Hall for 1950 was 11,210. In addition, the users of the library numbered 14,656; of the Museum, 1,167. On the basis of a five-day week for the eight active months of the year, this represents an average daily use of the College Hall by 159 persons.

Introduction of New Fellows

An innovation, suggested by the Secretary of the College, has to do with the introduction of new Fellows. In the future they will be invited to a dinner before the meeting at which they are to be introduced, the expense to be paid from the Mitchell Entertainment Fund, and following the dinner they will be taken on a tour of the entire building, will meet the executive staff, will be shown the facilities of the library and of the museum, and then will be seated, together with their sponsors, in the front rows of Mitchell Hall for the introduction.

Pension Fund

The pension fund of the College, established a year ago, is functioning satisfactorily and now is being modified so as to include the extra benefits of Federal Social Security. To cover the employee's part of the cost of the federal insurance, an increase in salary, slightly in excess of that extra expense, has been granted. For the elaboration of the details of this service to its employees the College is greatly indebted to its efficient Executive Secretary.

Life Fellowship

Thirty-three Fellows have taken advantage of the Life Fellowship Plan adopted during the last year, thus relieving themselves of further annual dues and making their total contribution at a time when best able to meet the obligation. This arrangement assures the College of full annual contributions to the Fellow's age of 70 and will obviate the necessity of resignation by certain Fellows when their income is materially reduced.

Sectional Meetings

The various Sections of the College have continued to function in satisfactory fashion. The Section on Medical History deserves special mention for its third year's contribution to the teaching of history to the students of the medical schools of the city. Six lectures were given, all by Drs. Richard H. Shryock and Owsei Temkin, of the Johns Hopkins Medical School, distinguished medical historians, and each of five of the meetings was presided over by one of the deans of the City's medical schools. For each of these lectures appropriate exhibits were prepared by the College Librarian, Dr. McDaniel, thus adding greatly to the value of the instruction and emphasizing the advantage of having the lectures at the College Hall. These lectures were financed through donations made by the Medical Schools.

Herb Garden

Thanks are again due to the ladies who maintain our unique medicinal herb garden. Though it is anticipated that before too long that part of the College property will be

temporarily disturbed by building operations, it is expected that eventually the Herb Garden will be fully restored in its present location.

Fellowship Status

The number of Resident Fellows, as of December 15, 1950, was 766; of Non-Resident Fellows, 67; of Honorary Fellows, 9; and of Honorary Associates, 2. Thirty-two Resident Fellows were elected during the past year, 14 were transferred to Non-Resident status, and 5 resigned. Fourteen Resident Fellows, 2 Non-Resident Fellows and 1 Honorary Fellow have died since December 10, 1949.

I now request that the Fellows stand as I read the names of those who have died during the year.

Resident Fellows

John L. Atlee
Tilghman M. Balliet
Henry C. Bazett
Eldridge L. Eliason
Augustus A. Eshner
J. Claxton Gittings
R. Max Goepp
Arthur P. Hitchens
Thomas B. Lee
Frederic H. Lewey
Louis H. Mutschler
Francis R. Packard
Joseph E. Roberts
Horace J. Williams

Non-Resident Fellows

Cyrus W. Fridy
John S. Lockwood

Honorary Fellow

George R. Minot

Future Policy

Finally, I wish again to call attention to the urgent and obvious needs of the College: more and more books, that cannot properly be cared for, are accumulating; the reading rooms at times are overcrowded; accessions to the museum continue, and the staff still is underpaid. At the same time new opportunities for service are constantly presenting themselves: further educational activities in the interest of medical students and young physicians; closer cooperation with, and service to, medical school libraries; radio and television programs and public lectures for the education of the public in matters of health and the prevention of disease; more complete service to industrial organizations with medical interests. To accomplish these things, however, additional operating funds are necessary.

The situation is such that a decision soon must be made as to which of, and to what extent, these various activities of the College shall be emphasized. In any event it is obvious that the College must continue to maintain an outstanding library, one that meets the imperative needs of all those interested in the practical and cultural aspects of medical art and science, also a forum for the presentation of the best and most authoritative work in the medical sciences and a unique and usable medical museum.

With the idea of eliciting the interest of the Fellowship in these vital matters and eventually of formulating a definite program, the Council has approved the appointment of a small committee, under the chairmanship of Dr. Jonathan E. Rhoads, to give special thought to this matter of future policies, to accumulate significant data and opinions and after a year to render a report to the College.

I now wish to thank the other Officers, the members of the Council and of its committees, both elective and appointive, the chairmen and the executive committees of the Sections and all the Fellows for their faithful and devoted service to the College during the past year. At the same time the devoted and unselfish service of the executive staff and all the employees is deeply appreciated.

Contributors to the Building Fund and to the Library of the College of Physicians of Philadelphia*

Fellows and Non-Resident Fellows

Adelizzi, Richard I.
Adler, Francis Heed
Aegerter, Ernest E.
Aiken, Thomas G.
Alexander, Fay K.
Allbritten, Frank F., Jr.
Allen, Frederick H.
Alpers, Bernard J.
Anspach, Brooke M.
Appel, Kenneth E.
Aronson, Joseph D.
Aronson, Roland S.
Astley, G. Mason
Atlee, John L., Jr.
Austin, J. Harold

Bacon, Emily P.
Barden, Robert P.
Bartle, Harvey, Jr.
Bates, William
Bauer, John T.
Baumann, Frieda
Bazett, Henry C. (*dec.*)
Beecham, Clayton T.
Beerman, Herman
Behrend, Albert
Behrend, Bernard
Behrend, Moses
Beizer, Lawrence H.
Belk, W. P.
Bell, Benjamin Tertius
Bixby, Edward W.
Blady, John V.
Block, Frank B.
Blumstein, George I.
Bockus, Harry L.
Bonney, Charles W.
Bortz, Edward Le Roy
Bostwick, Delazon S.
Bothe, Frederick A.
Bourland, Henry S.
Bradley, William N.
Briscoe, Clarence C.
Bromer, Ralph S.
Brown, Charles L.
Brown, Claude P.
Brown, Robert Bruce
Burnett, W. Emory

Cadwalader, W. B.
Camero, A. R.
Campbell, Edward H.
Carey, Lawrence S.
Carpenter, Chapin
Carson, John B.
Castallo, Mario A.
Caswell, H. Taylor
Chamberlain, George W.
Chapman, John P.
Chouké, Kehar S.
Ciccone, Emmet F.
Clarke, Francis Mann
Classen, Charles H.
Clerf, Louis H.
Cloud, J. H.
Cohen, J. Gershon
Cohen, Louis
Cohen, Louis B.
Colonna, Paul C.
Conger, Kyril B.
Cooper, David A.
Cornelius, Chalmers E.
Corson, Edward F.
Cowan, Alfred
Craig, Frank A.
Crane, A. Reynolds
Creskoff, Adolph J.

*As of 1 February 1951

Cross, Sumner H.
Crump, Jean
Cuttle, Tracy Donald

Dannenberg, Arthur M.
Davis, David M.
Davis, Perk Lee
Deaver, J. Montgomery
Dehne, Theodore L.
DeLong, Perce
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Memoir of Francis Randolph Packard*

By JOHN H. GIBBON

FORTY-TWO years ago I presented to this College a memoir of a previous vice president, John Hooker Packard, and tonight it is my sad duty to pay a similar tribute to his distinguished son, a late president of the college.

I find it no easy task to write of an intimate friend of sixty years and avoid superlatives and verbosity. Affection, admiration and constant association lead one, nearly inevitably, to these errors.

Francis Randolph Packard died on April 18th, 1950, at the Pennsylvania Hospital in his eighty-first year. His health had not been good for several years, but he never let this interfere with his interest and his duties connected with the institutions he cared most about: this College, the Pennsylvania Hospital, the Philadelphia Library, the Free Library of Philadelphia, the American Philosophical Society and the Shakespere Society.

He graduated from the Biological Department of the U. of P. in 1889, and from the Medical Department in 1892. The University later conferred on him the degree of LL.D. for his literary accomplishments and notably for his work on the history of medicine.

From 1893 to 1895 he was an interne at the Pennsylvania Hospital and he continued to serve this venerable institution in various capacities until the day of his death. During his term as interne he won the admiration of his associates who soon dubbed him "our walking dictionary". At that early period in his career he knew more about medicine, history and literature than his combined colleagues. But he was no stodgy bookworm; on the contrary he was full of wit and in for any mischief. To our admiration affection was soon added and I know of no man who was more respected and loved by a greater variety of people.

On finishing his interneship he started a "quiz" on Materia Medica and Therapeutics at the University, and there are Fellows of this College today who still are grateful to him for "passing" the stiff examinations, in these subjects, of Horatio C. Wood, one of our late Presidents. Following is a quotation from one of his quiz students, Frederick Fraley:

> "Our professor was the great Horatio C. Wood, vastly popular with the students, and a magnificent figure of a man who could instruct and entertain at the same time. He looked like the majestic Prospero in 'The Tempest', lordly, wise and benign, but he also had an Ariel, who accompanied him into the lecture room and clinic, and that blithe spirit was Frank Packard."

Packard early decided to devote himself to oto-laryngology and brought to this specialty an unusual knowledge of general medicine and good judgment. In this field he not only developed a high reputation and a large practice, but had bestowed upon him every honor which his confreres could give.

When war on Spain was declared in 1898 he at once entered the service as an assistant surgeon in the 2nd Regiment, Pennsylvania National Guard, and in later years when asked about his service, he would always say, "I spent my time at Montchanin, Del. protecting the duPont powder works from attack by the Spaniards".

Nineteen years later he had a longer and different sort of military experience in France as a member of the Pennsylvania Hospital Unit. When the Unit arrived at Le Tréport, without having known its

* Read before the College of Physicians of Philadelphia, 6 December 1950.

destination, he at once remarked, "Why here's where Queen Victoria and Albert landed from their yacht in 1843 to visit Louis Philippe at the Château d'Eu"—a few miles distant. Some months later he was giving talks, interspersed with wit and amusing anecdotes, to the assembled Unit on the history of that part of Normandy. A number of years previous to this, when he was conducting five ladies of his and my families into the dining-room of a Paris hotel, he whispered to one of them, "I feel like Chanticleer". These instances give a fair illustration of his erudition, memory and wit.

Like everyone else he was anxious to get to "The Front", and in order to do so he turned anesthetist and accompanied Dr. Charles F. Mitchell to the Poperinghe area during the Passchendaele offensive. He terminated his service in Paris as Consultant in Oto-laryngology in the U. S. Army.

Early in his career he began writing on medical history, and soon became a reliable authority on the subject. He was largely responsible for the creation and success of the Section on Medical History of this College. Among his best known writings are his "History of Medicine in the United States," "The Life and Times of Ambrose Paré," "The School of Salerno," "Some Account of the Pennsylvania Hospital" and "Guy Patin and the Medical Profession in Paris in the 17th Century." At the time of his death he had accumulated voluminous notes on Montaigne, evidently intending to add something to our knowledge of this renowned old essayist and philosopher.

He edited for 25 years the *Annals of Medical History* and for five or six years the *American Journal of the Medical Sciences*, being its sixth editor in 81 years. His interest in literature turned usually to English and French history and classics. He constantly quoted Shakespeare and Browning, and Thackeray and Trollope were probably his favorite novelists.

Frank Packard was essentially a scholar. The pursuit of literature was his avocation and might well have been his vocation. His constant wit could be gentle, but also caustic, especially as he grew older. He had no more prejudices than the rest of us, but held them more tenaciously and in appropriate company expressed them with vigor and expletive. He was definitely orthodox in religion, politics and medicine, and was suspicious of all radical change.

He was a raconteur whom everbody enjoyed. Of him Fraley says, "He was also a good listener but he suffered 'bores' not too gladly, and one might be aware of his failing interest by a certain resigned placidity of expression, such as Buddhist devotees employ in their contemplations". This attitude of abstraction became more frequent in his later life, but was often suddenly broken by an eruption of wit or sarcasm.

Francis Packard will be remembered by us all for his wisdom and humor and later generations will be enlightened by his writings. To his intimates he was ever the jovial companion and happy philosopher, and so I say to his spirit, "Gai Matelot, fais bon voyage"!

Memoir of Ralph Pemberton*

By TRUMAN G. SCHNABEL

RALPH PEMBERTON, who died June 17, 1949, was a native Philadelphian and a fellow of the College for forty years. He was born, September 14, 1877, of a distinguished American lineage dating back to the time of Phineas Pemberton, a Lancashirian friend of William Penn, member of the Provincial Council, and speaker of the Assembly in 1698. At the age of sixteen young Pemberton entered the University of Pennsylvania where he earned his baccalaureate and masterate in science, following the successful completion of a roster of study in which science and the humanities were equally well represented. After receiving his doctorate in medicine from the same institution in 1903, there followed a tour of residency in old Blockley, the beginning of private practice, and assistantship on the medical wards of the Hospital of the University of Pennsylvania and the neurological ones in the Philadelphia Hospital. For some years there was teaching for his medical alma mater and for others, research with the sponsorship of a Woodward Fellowship in Physiological Chemistry. Some nine years after receiving his degree in medicine, he undertook two years of graduate study in Berlin at the Virchow Krankenhaus and at the University of Strasbourg under the celebrated Franz Hofmeister. His European sojourn gave him a point of view and encouraged a habit of thoroughness and exactness in thinking which were to stand him in good stead for the rest of his life.

It is not surprising then that Pemberton's important bibliography of more than 100 items reflects a very early interest in neurology and at the same time an occupation with research in the field of endocrinology. Some of his first papers report on metabolic studies in diseases of the nervous and muscular systems, the nature of toxic reactions following X-radiation and the influence of the ductless glands on pancreatic function. After 1912, however, all of his contributions to medical literature relate themselves in one way or another to diseases of the joints.

We are told that the group of "rheumatics" in Blockley with funds long since depleted, only relieved of their painful disabilities by narcotics and pitifully discouraged in their outlook, served as a challenge to an investigative spirit which asserted itself as time went on. Frank Billings had just announced his doctrines of "focal infection" and quantitative methods for biochemical assays were being proposed and carried out for the first time. With the scene set in this fashion, he began pioneering in the very difficult field of the arthropathies, where very few had tried the tilling of its almost virgin soil.

On March 7, 1928, here in Mitchell Hall, the subject of this memoir delivered the twentieth Mary Scott Newbold Lecture in which he set forth for his audience the then existing knowledge concerning the etiology, pathology, and treatment of "Arthritis" and the rheumatoid disabilities. No inconsiderable part of this picture was supplied out of the research which had gone on under his direction at the Presbyterian Hospital for all of the years after his post-graduate study in Europe. A large part too was derived from intensive investigation which Major Pemberton, in charge, and a group of medical officers assigned to the U. S. Hospital No. 9 at Lakewood, N. J., had carried out during the first World War. After the war, he continued at the Presbyterian Hospital and later on transferred his efforts to the Abington Memorial Hospital.

* Read before the College of Physicians of Philadelphia, 6 December 1950.

From these two institutions came the many revealing publications written by Pemberton and his associates, which gradually oriented a scientific approach to, and stimulated a live interest in, the field of rheumatology the world over. As time passed, he was invited to membership, active and honorary, in many scientific organizations in this country, South America, Continental Europe, and England. The members of these associations, especially those concerned with rheumatism, physical medicine, and soldier rehabilitation, testify to his inspiring leadership and useful mentorship. From time to time too, and in some instances for a long time, he served actively and effectively in a consulting capacity for groups at national, state, and local levels. Extensive travels at home and abroad gave him an excellent opportunity to crusade not only in the cause of rheumatism with all of its varied and numerous ramifications but also for the cause of international friendship, good will, and "one world." He is appreciated by loyal friends as a true internationalist and it was a great blow to him when he was unable to preside at the meeting of La Ligue Internationale Contre le Rhumatisme held in New York City in the spring of 1949 because he was even then disabled by his final illness.

He exhibited varying moods, oftener vivacious than serious, but always friendly and helpful. He spoke fluently in German and French, less fluently in Spanish, to say nothing of his animated address in English. He continued on with Latin and Greek to the end, always deploring the performance of "slipshod academics" which permitted a steady fade out of the classics in the roster of current curricula. In all of which one is reminded of Dr. Samuel Johnson who deplored the "little Latin and less Greek" of his day. He was always an interesting conversationalist, always stimulating, not given to small talk, but always a good listener. He wrote with facility and did much writing on his vacation jaunts. On such occasions too, he produced delightful sketches with ink and water colors as his media even though he had never had a lesson in either of these techniques. Without benefit of lessons too, he was able to play the piano to his own satisfaction as well as that of his friends. He was aesthetic and it must be gathered that he had a fine appreciation of art and music.

Besides all of this, he had more than a passing interest in paleontology. So it was that he did his field work on other vacation days in the "Bad Lands" of South Dakota, and elsewhere too, in search of fossilized remains of life during prehistoric era. There is housed in the permanent exhibit at the Academy of Natural Sciences, one of his notable trophies in the shape of the skull of a great horned Dinosaur. On his authority as a competent paleontologist, although he styled himself as an amateur, he often called attention to arthritis as the oldest disease entity of which there is any record, because he found evidence of its existence in the fossilized remains of reptiles of the Cretaceous period, long antedating the advent of man.

This memoirist would count himself remiss were he to omit some reference to Dr. Pemberton's qualifications as a philosopher. There are those who valued all of the diversified facets which he brought to light but are insistent that the finest of these was the one in which he presented his thinking upon a variety of subjects. For those who missed the opportunity of hearing him reflect in such a manner there is enough evidence in contributions to lay literature which establishes for their author the possession of unusual intellectuality, capable of delving deeply into matters of a philosophical order. His essays on "The Place of Culture in American Life" and those in which he offers the views of a physician looking at education are particularly worthwhile in this respect.

In spite of these varied accomplishments, nothing mattered much except the "big horse" which he undertook to ride many years back with the willingness to devote a lifetime of effort to the job of putting some

order into a confused field. Noteworthy it is that out of the books of his patient-doctor experience and investigative effort, he was able to show that the rheumatoid diseases are systemic in nature and that the joints constitute a local manifestation of basic metabolic dysfunction. Under such circumstances no cursory patient examination would do and no single therapeutic procedure could be expected to produce the answer, desirable as this might be.

As a part of his concepts came his pedagogic insistence as long ago as 1932 upon the important etiological role played by the pituitary and other endocrine glands in rheumatoid arthritis. In spite of the recently observed dramatic effects of ACTH and other hormonal preparations in this disease, his major concepts remain unchallenged. Obviously there should have been a Kendall among one of his investigative teams. His concepts on the other hand have had no inconsiderable support by the generally accepted inclusion of the rheumatoid syndrome in the group of collagen diseases, and he was quick to have the applicability of Selye's pronouncements established for this same syndrome, in spite of much opposition.

In April, 1948, the University of Montreal conferred upon the subject of this memoir the degree of "doctor ad honorem." On this occasion he delivered an address "Sur la Nature du Rhumatisme." To address an audience in French was no new experience for him. His presentation dwelt for the most part on the pathogenesis of rheumatic disorders in a general way but stressed the neuro-endocrine possibilities in this regard. Obviously his interest in neurology and the endocrinopathies of his earliest years continued on and served him for a good purpose even in the waning years of his life.

It is quite clear in the minds of contemporary rheumatologists generally, that the impact of Pemberton's energy, vision, insight, and inspiration have had a far-reaching and telling influence on the whole picture of the rheumatoid states, not only in this country but perhaps even more so abroad. Some there are who refer to him as "The Father of American Rheumatology" and others, as "The Father of Arthritis."

Memoir of Eldridge L. Eliason*

By EUGENE P. PENDERGRASS

ELI, a rare teacher, a superb surgeon, and a friend whom 'his boys' will never forget."

With these words, the University of Pennsylvania Medical School Class of 1944, chose with admiration and affection to dedicate their section of the combined 1944–45 *Scope* to Dr. Eliason.

Eldridge Lyon Eliason was born in Chestertown, Maryland, the son of Wilbur and Mary L. Eliason (Mary Comegys Brown), on June 6, 1879. He acquired his early education at Hotchkiss Grammar School and entered Yale University from which he received an A. B. degree in 1901. His work at Yale was of a high order and while there he was elected to Phi Beta Kappa.

In his Junior year at Yale, Eli's father, asked him what he was going to do. Eli said, "I don't know." On another occasion, Mr. Eliason said, "Etch, what are you going to do?" Without much thought, Eli said, "I will study medicine." This was just before entering his senior year. The father told Eli's mother that Eli had said he was going to study medicine just to shut him (the father) up. Mrs. Eliason said, "Etch, why in the world did you ever tell your father that you were going to study medicine? You almost faint at the sight of blood." However, Eli took the proper pre-medical courses and prepared to study medicine.

After finishing Yale, Eli arranged with his father to go to Philadelphia to matriculate in the medical school. So far as Eli was concerned, there was only one medical school in Philadelphia and that was Jefferson. His allegiance to Jefferson was stimulated by the memory and achievements of his Uncle John Eliason who graduated near the top of his class at Yale and at the top of the 1877 class at Jefferson Medical College. Eli's Uncle John never practiced medicine because he died from typhoid fever (typhoid pneumonia) two weeks after his graduation.

After arriving in Philadelphia with his diploma under his arm, Eli asked a streetcar conductor how to get to the medical school. The conductor said, "I go right past it." Eli was let off at thirty-sixth street. He walked down to the medical building, Logan Hall, and went in where it said "Admissions." Dr. John Marshall, standing there said, "Good morning, Mr. Eliason, what can I do for you?" (Dr. Marshall recognized Eli from a gymnast meeting held at the Academy of Music a few years before.) Eli said he wanted to enter the medical school. Dr. Marshall gave him a card to fill out. After filling out the card, Eli saw that it said "University of Pennsylvania". Said Eli, "Oh, I have come to the wrong place." Whereupon, Dr. Marshall answered, "No, Mr. Eliason, you have come to the right place." Eli had to do some fast thinking. He thought, "Am I going to a 'mucker school'?" At that time the men from Yale called the University of Pennsylvania a 'mucker school'. Eli quickly decided Penn must be a pretty good medical school because Dr. Marshall had recognized him. Dr. Eliason received his M. D. degree from the University of Pennsylvania in 1905, following which he served a two year internship in the University Hospital.

In attempting to learn about early influences which may have directed Eli into surgery, several stories are of interest.

While still a senior in medical school, Eli was down on the farm on one occasion, when one of the dogs on the place tore its abdomen to such an extent that the intestines came out. With a colored farm hand giving ether,

* Read before the College of Physicians of Philadelphia, 6 December 1950.

Eli replaced the intestines and sewed up the abdomen. Shortly thereafter, the dog jumped out of the window. The dog got well.

On another occasion, a colt died from what the local veterinarian called "lung fever". Eli was not satisfied. He though the colt had "botts". The larvae of the botfly of the genus Oestrus, infest the throat, stomach and intestines of the horse. Eli did a post on the horse and confirmed the diagnosis.

While Eli was an intern, he had to pinch-hit for one of the surgical interns who was sick. At one of the clinics, Dr. Eliason rolled a bed into the clinic and one of the rollers went over the foot of Dr. J. William White. Dr. White turned upon Eli and said, "What in the hell are you doing?"—or something to that effect. Eli, although scared to death, said, "Your foot shouldn't have been there."

This was the sort of answer Dr. J. William White apparently liked because there began a friendship. At the end of Eli's internship, Dr. White saw him in the hall one day and said casually, "I want you to report to the surgical dispensary at eleven o'clock tomorrow." This was really the first time that Eli realized he was going into surgery. He was also surprised to learn that Dr. White had mapped out a whole program for him without previously discussing the matter.

For young Eliason, the road to success as a clinical surgeon was not easy. Rugged experiences in earlier years influenced his philosophy considerably during his professional years. Dr. Eliason was assistant surgeon to the University Hospital from 1908 to 1922 and surgeon from 1923 until November 2, 1945. Other institutions in which he worked include:

Assistant Surgeon — Howard Hospital — 1908–1920

Assistant Surgeon—Philadelphia General Hospital—1914–1928

Surgeon—Howard Hospital—1921–1929

Surgeon—Philadelphia General Hospital—1927–1947

Surgeon — Presbyterian Hospital — 1933–1950

Surgeon — Delaware County Hospital—1927–1936

Surgeon — Mount Sinai Hospital — 1930–1936

Dr. Eliason was a skillful surgeon, careful in technique and exacting in the care of his patients. He was deeply conscious of his responsibility for training clinical surgeons and he trained them well.

Eldridge Eliason long will be remembered by his associates for his devotion to duty, for his fine abilities, for the strength of his character and for his unique personality. He bequeathed to the Hospital of the University of Pennsylvania a fine tradition of surgical care—the patient always came first, without regard to time or position in life, or with any thought of the personal sacrifice involved.

In addition to being a sound clinical surgeon, Dr. Eliason was a splendid and stimulating teacher, who prepared his material for presentation in a manner which received widespread approval from his students.

His talk and demeanor bore the tang of the Eastern Shore. His sense of humor and his solid, earthy philosophy stemmed from his early associations. Some of his homey aphorisms will be remembered for years to come.

"A good surgeon is a good clinician who can operate."

"Accidents don't happen. Carelessness simply permits a natural occurrence."

"Be relaxed when delicacy of touch is needed."

"Don't cut until you know what it isn't."

"Any abdominal pain of over six hours' duration is surgical in ninety per cent of the cases."

"If the clinical and laboratory findings don't agree, do 'em over again."

"Keep the chemistry up and the belly down."

"Do a rectal examination and in fifty per cent of the cases you won't need a consultant."

"Cathartics in acute abdomens kill more people than gunpowder except every twenty years."

"A pulse that 'leaves your fingers' quickly,

ofttimes means that the patient will also leave you."

"When a patient knocks at the 'Pearly Gates' twice in one week, he usually gets through."

"Give me a dependable boy and you can keep your brilliant ones."

"Be slow to promise, but having made a promise, keep it."

Dr. Eliason began as an assistant instructor in surgery in 1907, became an instructor in 1916, an associate in 1919, assistant professor in 1923, a Professor of Clinical Surgery in 1925 and John Rhea Barton Professor of Surgery in 1936, a post that he held until November 1945. He was elected Emeritus Professor of Surgery in 1946. He also held corollary positions in the Graduate School of Medicine.

Dr. Eliason was a contributor to surgical literature and he made valuable contributions to clinical surgery. His intimate knowledge of fractures was hardly equalled by any other surgeon of his time in Philadelphia. Familiar aphorisms of his concerning fractures are:

"A fracture result should be evaluated by the result in life, limb function and contour in that order."

"Treat the patient and not the film."

"A properly reduced and properly dressed fracture should give increasing comfort."

"Pressure pain over tissues ceases when necrosis occurs."

"Splint 'em where they lie."

"Walk 'em into union."

Dr. Eliason was one of the host of Pennsylvania men who have served their country at war. Commissioned a first lieutenant in 1917, he served as a surgical chief of Base Hospital 20 and Evacuation Hospital 113, and as commanding officer of Operating Team 61, which specialized in the management of desperate casualties. He attained the rank of lieutenant colonel in 1919.

In every institution with which Dr. Eliason was connected, he sooner or later became a faculty member, or a member of the nursing committee or advisor to the School of Nursing. He was interested in nursing schools, bedside teaching and nurse organizations. *Surgical Nursing*, written by Dr. Eliason, has appeared in many editions and continues to be one of the best texts on that subject.

The nursing profession never had a better friend. Problems concerned with policy as it pertained to the individual nurse or to broader considerations were presented to Eli on many occasions. Some of the problems presented for solution would have posed real difficulties for a parent and psychiatrist, yet, Eli, a bachelor, after deliberation usually would evolve the correct solution. It is to be recalled that among other duties that Eli took care of on the farm, was raising horses. Eli used to "break" the colts. It has been said that this may have been helpful in breaking "filly" nurses.

Dr. Eliason liked nurses to be neat in appearance, especially to have clean shoes and hands and nails. He liked a dignified manner and his lectures on "Ethics" were intensely interesting and accompanied by imitations of actions unbecoming to a young "lady". His often-spoken words to the student nurse, unnerved at the end of her first scrub on a difficult case, "Child, you did a grand job", bespeak the understanding and humility that so characterized the man and his work.

At the University, he was frequently invited to speak to the nurses on commencement day. This invitation he always accepted and his addresses on those occasions were simple and forceful. Dr. Eliason is the only doctor ever made an honorary member of the University of Pennsylvania Nurses Alumni Association.

Dr. Eliason was not a person who could be accused of being a "joiner" yet he belonged to Phi Alpha Sigma, Zeta Psi, Phi Beta Kappa, Society of Sigma Psi and Alpha Omega Alpha. He was the patron of the Agnew Surgical Society from 1935 to 1945, Fellow of the American College of Surgeons and was a member of the American Surgical Association, International College of Surgeons, American Board of Surgery, College of Physicians of Philadelphia, Academy of Surgery of Philadelphia, the County and State Medical Societies, Surgi-

cal Research Society and the American Association for Traumatic Surgery.

Dr. Eliason was very much interested in the new building program of the College of Physicians of Philadelphia to which he contributed $2,000.

Dr. Eliason was always interested in sports and gymnastics, not only as a spectator but as a participant. Among his athletic achievements are included the following:

Member—Yale Freshman Baseball Team
Member—Yale Varsity Baseball Team—3 years
Captain—Yale Varsity Baseball Team—1901
Member—Yale Gymnastic Team—4 years
Captain—Yale Gymnastic Team—1901
Intercollegiate Amateur Gymnastic All Around Champion, United States and Canada—1901
Voluntary Coach—University of Pennsylvania Gymnastic Team 1906–1930

Eli's love for gymnastics began on the farm. He would turn flips on haymows until they became perfect. That was the beginning of his experience in tumbling. Eli was proud of his figure. When other boys were going around with girls, Eli would say to his brothers, "I would rather have a good figure than a good looking face."

Sports in which he excelled included tennis, sailing and golf. Walter Camp was a great favorite of Eli's and he often quoted a verse of Camp's.

"Work hard, play well
Crow gently when in luck,
Put up, shut up
And acknowledge when licked."

Eli went through life as his brother's keeper. Following his father's sudden death, he took on the responsibility of caring for other members of the family, maintaining a home for them and in spite of a very modest income, contributed to their support until they could be on their own.

Eli was interested in "Boys Town". By his desk, was hung a poster. On it could be seen a boy carrying an injured comrade. The boy says, "He ain't heavy, Father, he's m'brother."

Eli was a real Christian—he never talked it, but lived it. One of the real reasons that he took up medicine, according to his own statement, was that he could do more for humanity in medicine than in any other line of work.

As an individual, Eli was not the so-called "good fellow" although I think it is true that he envied friends who fell into that category. He was shy and sensitive and in his earlier years, to protect himself, he built a wall of reserve around himself that was difficult to pierce, even by his close friends. He was not emotional but he had his likes and dislikes. If he disliked a person, few knew about it other than the individual and himself. Eli rarely changed his mind on such things but Eli did not gossip, so it was impossible to know what he was thinking.

Although Eli had rather simple tastes, he was fastidious in his dress. Even in the operating room, his scrub suits were tailored and his masks were silk. He did not drink, smoke or overeat. His self-discipline in these and other things was emulated by members of his staff.

Eli was always punctual. He did not keep people waiting and did not like to be kept waiting by anyone. This was true in his home as well as in the hospital. One evening, dinner guests invited for six o'clock, arrived when dessert was being served. They had dessert and coffee.

Doctor Eliason was a versatile man but primarily a great teacher and a sound clinical surgeon. He was a slave to his work, yet provided for a given period of exercise. He was intellectually honest, he disliked mental sidestepping and ignored collateral subterfuge. Any attempt to suppress truth, or distort it, incurred his complete disdain.

Eldridge Lyon Eliason was in his seventy-first year when he died on March 6, 1950 from periarteritis nodosa after a relatively short illness. As time passes, many will arise to fill his place in the vineyard of medicine, but any man who can properly be classified with Eldridge Eliason will be happy indeed.

Memoir of John S. Lockwood*

By I. S. RAVDIN

JOHN SALEM LOCKWOOD was born on October 2, 1907 in Shanghai, China, the son of William Wirt Lockwood who for many years was head of the Y.M.C.A. in that country. He received the degree of Bachelor of Arts at DePaw University in 1928, and the Doctor of Medicine from Harvard Medical School in 1931. In 1938 he received the Doctor of Science in Medicine from the College of Physicians and Surgeons at Columbia University. Following his graduation, he interned at the Presbyterian Hospital in New York from 1932 to 1934, and in the Free Hospital for Women in Brookline, Massachusetts from 1934 to 1935. He then returned to the Presbyterian Hospital in New York, first as Junior Surgical Fellow and later as Senior Surgical Fellow. He came to the University of Pennsylvania as Instructor in Surgery and Harriet M. Frazier Fellow in Surgical Research in 1937 and remained with the Department of Surgery until 1944, having attained the rank of Assistant Professor of Surgical Research and Acting Director of the Harrison Department of Surgical Research. In 1944 he was called to Yale University as Associate Professor in Surgery, remaining there until 1946, when he was called to the College of Physicians and Surgeons in New York as Professor of Surgery. From 1944 to 1946 he was Chief of the Division of Surgery, Committee on Medical Research of the Office of Scientific Research and Development in Washington. He was a member of the Committee on Surgery and Chemotherapy of the National Research Council. He was a member of the Surgical Study Section of the National Advisory Health Council of the United States Public Health Service, and from 1941 to 1946 was a Consultant to the Secretary of War. He held memberships in many societies, including the American Association for Cancer Research, The American Society for Clinical Investigation, in which organization he was a counselor from 1945 to 1948; The American Surgical Association, The Harvey Society, The Society of Clinical Surgery, The Halstead Society, and The Society of University Surgeons of which organization he was president in 1948.

I well remember the first occasion on which I met John Salem Lockwood. The incident tells a great deal about the man. He had come to my office in the Harrison Department of Surgical Research in the spring of 1937 to discuss the possibility of his joining our staff. Just before he arrived I had an urgent telephone message from New York, requesting that he call New York as soon as he arrived at my office. It was so urgent that, after the briefest of greetings, I had him make the call. He received the message that news had just come that his father had died in Shanghai. I saw how deeply touched he was and I suggested that he might like to come back in a week or more, and we would then discuss the matter which we had before us. He thought for a few moments, and said: "My father would have wished that I discuss this now and I am prepared to do so".

I was immediately attracted to this young man who was so frank and resolute and, with it all, so courageous. We decided that he was to come and join our staff and become a member of the surgical family of the University of Pennsylvania. He was soon loved and respected by all who came to know him. Young men in training soon found the path to his laboratory. During a considerable period of the time when I was on active duty, he was the acting director of the Harrison Department of Surgical Research. He organized the Laboratory of Surgical Bacteriology in the department and carried out important and extensive studies on the

* Read before the College of Physicians of Philadelphia, 6 December 1950.

sulfonamides and penicillin, a field in which he rapidly became an authority. Around him centered important research on the war gases. He provided the impetus for the research program on the use of certain plasma substitutes. He initiated the evaluation of the influence of nutrition in surgical convalescence. All this and much more was begun at a time when he had only recently recovered from a serious illness.

He was possessed of a deep love for people and he accepted them for what they could contribute to the many fields which interested him. He was a man completely free of bias and bigotry.

No challenge was too great to accept. Without thought of his physical limitations he gave the institutions with which he was associated his every effort. The rich heritage which he has left will live in each of them.

Few men have accomplished so much, in so short a time, in spite of repeated illness of the most serious nature. What he accomplished is testimony to his great and unique abilities, and to the seriousness and loyalty with which he carried on his work, without regard to his health.

Dr. Lockwood died from the aftermaths of repeated coronary infarctions. The first of these infarctions occurred while he was a member of the surgical staff of the Hospital of the University of Pennsylvania. During his recovery from this illness he suffered a major embolus which required embolectomy. In spite of this serious illness he carried his full share of work throughout the remainder of his life. He died in the Presbyterian Hospital in New York on June 20, 1950. He is survived by his wife, Dorothy and three children, Elinor, Marcia and Dorothy. For his many contributions to the life and growth of surgery and for his warm personal friendship which many Fellows of this College have shared, he will be long remembered by the Fellows of this College and by his associates in surgery throughout the world.

Transactions of the Sections

SECTION ON GENERAL MEDICINE

23 October 1950

EFFECT OF CORTISONE IN SARCOIDOSIS. Maurice Sones*, M.D., Harold L. Israel*, M.D., Mary B. Dratman*, M.D., and Jesse H. Frank*, M.D. (Discusser: Ralph Jones, Jr.*, M.D.) (*Abstract 1, below.*)

AN EVALUATION OF PANCREATIC FUNCTION TESTS. C. Wilmer Wirts, M.D., and William J. Snape*, M.D. (Discusser: H. F. Friedman*, PH.D.) (*Abstract 2, below.*)

ISCHEMIC VERSUS NEUROPATHIC NECROSIS IN DIABETES MELLITUS. Meyer Naide, M.D. (Discusser: W. Wallace Dyer, M.D.) (*Abstract 3, below*).

PERIODIC SIALORRHEA. Hobart A. Reimann, M.D., and John Lindquist*, M.D.) (Discusser: William G. Leaman, Jr., M.D.) (*Abstract 4, below.*)

27 November 1950

THE THERAPEUTIC SIGNIFICANCE OF HYPONATREMIA IN CONGESTIVE HEART FAILURE. J. Russell Elkinton, M.D., and Russell D. Squires*, M.D. (Discusser: Samuel Bellet, M.D.) (*Abstract 5, below.*)

THE CEREBRAL EFFECTS OF PAPAVERINE HYDROCHLORIDE IN TOXEMIA OF PREGNANCY. Milton L. McCall, M.D., T. Vernon Finch*, M.D., and Harry W. Taylor*, M.D., (Discusser: Henry A. Shenkin, M.D.) (*Abstract 6, below.*)

THE SERUM LIPID FRACTIONS IN LIPEMIA RETINALIS. Salvatore C. Carfagno*, M.D., William A. Steiger*, M.D., and Edward S. Dillon, M.D. (Discusser: Charles R. Shuman*, M.D.) (*Abstract 7, below.*)

VISUAL AIDS IN THE THERAPY OF PSYCHOSOMATIC CONDITIONS. O. Spurgeon English, M.D. (Discusser: Kenneth E. Appel, M.D.) (*Abstract 8, below.*)

* *By invitation.*

SECTION ON MEDICAL HISTORY

Third Series of Lectures for Medical Students

I. THE MEANING AND VALUES OF MEDICAL HISTORY. Richard H. Shryock*, PH.D. (*30 October 1950*)

II. CLASSICAL AND MEDIEVAL MEDICINE. Owsei Temkin*, M.D. (*6 November 1950*)

III. RENAISSANCE. Owsei Temkin*, M.D. (*13 November 1950*)

IV. SEVENTEENTH AND EIGHTEENTH CENTURIES. Owsei Temkin*, M.D. (*20 November 1950*)

V. NINETEENTH CENTURY. Richard H. Shryock*, PH.D. (*27 November 1950*)

VI. TWENTIETH CENTURY. Richard H. Shryock*, PH.D. (*4 December 1950*)

SECTION ON OPHTHALMOLOGY

19 October 1950

REPLACEMENT OF SKIN GRAFT BY BASAL CELL CARCINOMA; CASE PRESENTATION. Edmund B. Spaeth, M.D.

SYMPOSIUM ON CORTISONE AND ACTH

CORTISONE AND ACTH; RESULTS OF TREATMENT. Harold G. Scheie, M.D., George S. Tynor*, M.D., and John A. Buesseler*, M.D.

CORTISONE AND ACTH. Arno E. Town, M.D., and A. E. Rakoff, M.D.

LOCAL AND SYSTEMIC CORTISONE IN OCULAR DISEASE. Irving H. Leopold, M.D., P. Robb McDonald, M.D., James E. Purnell*, M.D., Edward J. Cannon*, M.D., and Charles G. Steinmetz*, M.D.

16 November 1950

TUMORS OF THE IRIS: PATHOLOGY AND TREATMENT. Parker Heath*, M.D. (*Thirteenth Annual de Schweinitz Lecture.*)

21 December 1950

VARIABLE OPHTHALMOPLEGIA DUE TO ANGIONEUROTIC EDEMA. Wilfred E. Fry, M.D., and Nathan S. Schlezinger*, M.D.

Follow-up about Exposed Implant. Patrick J. Kennedy, M.D., and James S. Shipman, M.D.

Cause of Failure in Retinal Detachment Surgery. P. Robb McDonald, M.D. (Discusser: James S. Shipman, M.D.)

SECTION ON OTOLARYNGOLOGY

15 November 1950

New Data on the Vestibular Responses to Turning in Normal Subjects, including Nomograms for the Detection of Streptomycin and Other Drug Toxicities and for the Prediction of the Normal Variations in the Staggers and Vertigo. Alan Rubin*, M.D., Julius Winston, M.D., Helen Metz-Rubin, M.D., and Leonard Berwick*, M.S.

The Effects of Dramamine upon Cochlear Function and the Vestibular Responses to Turning in Normal Subjects; Suggestions as to the Pharmacologic Action of Dramamine. Julius Winston, M.D., Alan Rubin*, M.D., John F. Lewis*, M.D., and John M. Rehberger*, M.D. (Discusser: B. H. Shuster, M.D.)

The Role of Bacteria in Respiratory Allergy. Louis E. Silcox, M.D. (Discusser: Malcolm W. Miller*, M.D.)

20 December 1950

The Management of Bilateral Recurrent Laryngeal Paralysis. C. L. Jackson, M.D. (Discusser: Louis H. Clerf, M.D.)

Transtympanic Medication for Ménière's Disease. Matthew Ersner, M.D., Ernest Spiegel*, M.D., and Maurice Alexander*, M.D. (Discusser: Ernest Spiegel, M.D.)

Abstracts

Abstract 1

Effect of Cortisone in Sarcoidosis. Maurice Sones, M.D., Harold L. Israel, M.D., Mary B. Dratman, M.D., and Jesse H. Frank, M.D.

Endocrinological study of two patients with severe and widespread sarcoidosis has revealed some evidence of impaired adrenal function as indicated by diminished 17-ketosteroid excretion, increased tolerance to orally administered glucose, impairment of water excretion, eosinophilia and neutropenia. Use of cortisone resulted in prompt and marked improvement. The first case a 28 year old Negro female with skin, eye, lymph node and lung involvement of 3½ years' duration was given a total of 3 gms. of cortisone over a period of fifteen days. Changes in the skin lesions were noted within forty-eight hours and retrogression persisted two months following therapy. This was also noted in the pulmonary lesions. This case was complicated by the development of a paranoid schizophrenia. This was considered to be a toxic psychosis due to cortisone. Recovery resulted following electroshock therapy.

The second case was a 20 year old Negro female with a three months' history of respiratory symptoms and weight loss and involvement of lungs, lymph nodes, lacrimal and parotid glands. Treatment with 2 gms. of cortisone over a period of eleven days resulted in marked retrogressive changes in the lungs and almost complete disappearance of the lacrimal and parotid gland enlargements. These changes have persisted for a period of four months.

Further trial of both ACTH and cortisone in sarcoidosis is in progress to determine more definitely their relative therapeutic value as well as to clarify the nature and extent of endocrinological changes in this disease.

Abstract 2

An Evaluation of Pancreatic Function Tests. C. Wilmer Wirts, M.D., and William J. Snape, M.D.

In essence the diseases of the pancreas for which one is testing are either inflammatory or neoplastic, and the functional change produced is either pancreatic insufficiency or an obstructive phenomenon. Insufficiency is usu-

ally the result of an advanced diffuse lesion; the obstructive mechanism may result from an acute inflammatory process with minimal fibrotic change or a neoplasm located in the head of the pancreas.

By reviewing the available methods of testing pancreatic function we find the fasting serum amylase level is generally considered a satisfactory method of studying acute pancreatitis. In advanced disease the alteration in the character of the stool and glucose metabolism are diagnostic aids. The secretin test is a more accurate method of determining pancreatic function but it has the serious drawbacks of being too cumbersome, time consuming and expensive. On the other hand study of the serum enzymes after pancreatic stimulation is a simplified procedure which warrants further study.

Abstract 3

Ischemic versus Neuropathic Necrosis in Diabetes Mellitus. Meyer Naide, M.D.

Necrotic lesions of the toes and feet of patients with diabetes mellitus are not all due to ischemia. Twenty to thirty per cent of foot lesions in diabetics are on a neuropathic basis. Because the prognosis and treatment of these two types of lesions differs so greatly their differentiation becomes important. Case histories are presented illustrating the two types of necrosis in toes of diabetics. The neuropathic lesions are not the result of ischemia to nerves. A typical case is presented illustrating the progression of neuropathic changes in the bones of the foot in the presence of adequate circulation. The differential diagnosis of these two conditions is discussed. An important point in differentiating the two types of necrosis is the presence of bone destruction as the result of neuropathy and the absence of bone destruction in the ischemic toe. Destruction of bone requires some blood flowing through it to carry away the calcium, phosphorous and other products of bone necrosis. The treatment of these two conditions differs in important respects.

Abstract 4

Periodic Sialorrhea. Hobart A. Reimann, M.D., and John Lindquist, M.D.

The patient, a woman of 42, complained of excessive salivation. Shortly after the patient's last few teeth were removed for arthritis in 1948, she began to notice episodes of excessive salivation. An episode lasted a day or more and recurred every 6 to 10 days. According to her statement as much as 4 pints of saliva would be secreted during a spell. At the same time there were occipital pain, soreness of the right side of the mouth and pain in the chest. The patient was studied at another hospital for three months a year ago and all of many laboratory and other tests gave normal results, except for persistence of eosinophilia of between 23 and 44%. Trichinosis, periarteritis and Addison's disease were suspected, the latter because of hypotension.

The patient was admitted to the Jefferson Hospital in May of 1948 and observed for 3 months. The only abnormality on physical examination was bilateral palpable, firm, nontender sub-maxillary salivary glands, the right larger than the left. All laboratory studies again gave normal results, except for persistent eosinophilia of between 30 to 44%. A sialogram showed normal salivary glands, except that the right one was enlarged. Twelve episodes of sialorrhea were observed at intervals of 6 to 12 days. Two longer periods suggested that either episodes were delayed or skipped. In a period of 24 to 36 hours a quantity of collected saliva measured from 350 to 820 cc., but much was lost to measurement at night during sleep by drooling. Four menstrual periods were observed but have no relation to the episodes.

The question arose whether or not this peculiar circumstance of periodic sialorrhea was related to other forms of periodic disease previously described, such as periodic fever, arthralgia, abdominalgia and neutropenia. The duration of the cycles and the well-being of the patient suggested that her condition could be included as a member of the group.

Abstract 5

THE THERAPEUTIC SIGNIFICANCE OF HYPONATREMIA IN CONGESTIVE HEART FAILURE. J. Russell Elkinton, M.D., and Russell D. Squires, M.D.

Fourteen balance studies were carried out in twelve edematous cardiacs, most of whom were hyponatremic, and all of whom had become refractory to mercurial diuretics. The majority were given hypertonic sodium solution, some received potassium, and a few were given both ions.

During control periods in six patients the serum sodium concentration fell to even lower levels when the patient was in sodium equilibrium or was retaining sodium. The administration of hypertonic sodium solution resulted in some degree of diuresis in only four of ten patients; in only one was the edema completely cleared. Most of the patients developed thirst while still hyponatremic. The administration of potassium, with or without sodium, to a few of the patients was not associated with any diuresis, although potassium was retained in the cellular phase.

It is concluded that while systemic sodium depletion may be present, may be depressing the circulation, and may be treated successfully with hypertonic sodium solution, other factors are involved in this syndrome leading to retention of water rather than to loss of salt. Alteration in intracellular osmolarity may be one of these. Only when these factors are understood will the precise indications for therapy of this syndrome be known.

Abstract 6

THE CEREBRAL EFFECTS OF PAPAVERINE HYDROCHLORIDE IN TOXEMIA OF PREGNANCY. Milton L. McCall, M.D., T. Vernon Finch, M.D., and Harry W. Taylor, M.D.

Using the method of Kety and Schmidt, the authors have studied the quantitative cerebral blood flow and metabolism in toxemic pregnant women. It was found that there was a highly significant increase in the cerebral vascular resistance thought to be due to vasospasm. Because of this, the effects upon cerebral physiology of various vaso-dilators are being scrutinized in such patients.

The cerebral blood flow and metabolism were determined both before and after administration of papaverine hydrochloride in parenteral doses of one to three grains. Ten patients with non-convulsive toxemia of pregnancy were studied. The mean arterial blood pressure was decreased 19%, the cerebral blood flow increased 24%, the cerebral vascular resistance decreased 35% and the oxygen utilization by the brain increased 31%.

Recently infusions of papaverine have been given over a period of several hours, and it is concluded that this drug gives promise as a valuable adjunct to the therapy of toxemia of pregnancy.

Abstract 7

THE SERUM LIPID FRACTIONS IN LIPEMIA RETINALIS. Salvatore C. Carfagno, M.D., William A. Steiger, M.D., and Edward S. Dillon, M.D.

The serum lipid fractions in lipemia retinalis are re-evaluated in light of recent work on the stabilization of serum lipids. The writers discuss the lipid fractions of five diabetics with lipemia retinalis in an attempt to account for the lipemic or "milky" serum observed in these cases. The phospholipid action as a solubilizing influence on the other lipids is stressed. It is found that although all serum lipid fractions are increased, the phospholipid portion is increased the least. This results in a decrease in the important phospholipid to total fat ratio. This ratio is found to be an important factor in predicting the presence or absence of milky or clear serum. In all cases in which the serum was milky the ratio falls significantly below the normal or 0.43. With recovery and disappearance of the milkiness of the serum the ratio again returns to normal.

The writers also mention the phospholipid to total cholesterol ratio and point out that this ratio may be of value in its correlation

with the presence or absence of xanthomata and other atheromatous lesions.

Abstract 8

VISUAL AIDS IN THE THERAPY OF PSYCHOSOMATIC CONDITIONS. O. Spurgeon English, M.D.

The treatment of psychosomatic symptoms follows after several steps have been worked through. The first step is a good history which includes patient's emotional reactions to life up to the history-taking interval. Next, should come a physical examination and such laboratory work as will enable the doctor to make a diagnosis. If the diagnosis is one which calls for psychotherapy then the patient must be helped to understand how the emotions can affect physiology in such a way as to produce tissue change or discomfort, or both. Since this is a difficult phenomenon to visualize, charts can be used to aid the demonstration. Such charts are shown for the purpose of trying to simplify the explanation to the patient.

Annual Report on the Library*

As THE administrative assistant librarian, Mr. Elliott H. Morse, was in charge of most of the operations of the library throughout the period covered by this report, the report will properly begin with a statement from him. Following it, and preceding the usual statistical summary, something will be said concerning acquisitions and other activities in the historical field; and, then, concerning the extra-mural professional activities of various members of the staff.

Comments of the Administrative Assistant Librarian

General. The College of Physicians library has always enjoyed the informed interest and enthusiastic support of the Fellowship of the College and its many friends outside of this inner circle. During the past few years the library has taken advantage of the opportunity afforded by the generosity and interest of the Officers and Fellows of the College to tell the story of its present needs and future aspirations. A preliminary statement of needs drawn up five years ago has been thoroughly discussed and has received an architect's translation into definite proposals. Subsequent discussion and reevaluation brought these plans to the stage where they were presented to the entire Fellowship and with the modifications which resulted from this presentation they will presently reach the wider audience of the general public. This planning has recognized the needs of the library for greater income as well as for more adequate housing facilities.

Pending the accomplishment of this long range plan the library's current operating level has been maintained in the face of constantly increasing costs by the willingness of the College administration to increase the library's share of the budget and by the ready acceptance of our contribution plan by the individual non-Fellow and the commercial users of the library. In many cases this support from our friends has exceeded the actual requirements of the plan.

Particularly gratifying testimonies in the form of $1,000 contributions were received from the Smith, Kline and French Laboratories, Wyeth Inc., Sharp & Dohme Inc., and Mr. R. L. McNeil, and a donation of $500 was also received from Merck and Co., Inc.

Parts of the library story which have received the attention and study of its friends are outgrown stack facilities, budgetary limitations on book and periodical acquisition, and inadequate salary levels. A detailed analysis of our personnel requirements remains to be presented. Such an expansion is as much a prerequisite of improved service as are greater stack capacity and increased book and periodical appropriations. The present staff's complete occupation with the problems of day-to-day work does not permit the raising of our services above the levels of adequacy. The most modest planning suggests the need for two more assistants on the staff of the library. One of these additions could act as an assistant at large to aid in the reading rooms during peak periods with readers' advisory work and on problems requiring special attention. During such periods a single assistant's occupation with the desk mechanics of circulation and the demands of two busy telephone lines does not leave time to search catalogs and indexes or even to check the references of readers in distress. During slack hours such an assistant could plan and supervise routine housekeeping chores such as shifting books in the stack, maintaining library supplies, preparing schedules, listing duplicates for sale or exchange, distributing library pamphlets, booklists, lists, and posters, and implementing the plans and policies of the library administration.

A second assistant is needed to deal with the problems connected with the preparation of new material for use by our readers and the reprocessing of the quantities of uncataloged

* 1 November, 1949—31 October 1950.

pamphlets and theses which we possess. Our present catalog needs weeding and revising, and the present staff cannot attend to these problems of the past without delaying the flow of current material which is in demand. The very tools with which we work are becoming dull and we cannot take time from our work to sharpen them.

In addition to the routine housekeeping problems, some of which have been indicated above, the library would like to offer additional services either for a fee or free. Some of these which suggest themselves are the preparation of current bibliographies on topics of immediate interest, reference searches for library users, and the expansion of photographic reproduction facilities and services.

Future scientific advances and changes in the traditional ways of presenting and transmitting information as well as evolution of different study habits and ways of acquiring knowledge may suggest more unorthodox methods in the future. Libraries may undertake to provide reprint services in selected subject fields, they may maintain and service deposit libraries in laboratories and offices and they may even send copies of library materials to subscribers to a facsimile transmission service by wire. The library should be able to take advantage of any advances in science to deal with new problems and situations as they arise.

Miscellanea. The library records with pleasure the visits to the library by the Training Class of the Free Library of Philadelphia and the Freshman Class of the Woman's Medical College. In the latter case, as usual, a selective list of reference sources available in the library was prepared for distribution and a short exercise was prepared to give them practice in using the library's catalog and indexes. The library administration would welcome similar visits from other medical schools in the area and believes that these visits can be made interesting and profitable to these students.

The library assisted the College administration in the preparation of the booklet, "The Challenge" which was circulated among the Fellowship. The library also supplied its part of the exhibit which was prepared to support applications by the College to philanthropic foundations for support.

During the year the library was able to supply material to libraries in such far away places as the University of Malaya and Uganda, East Africa, the second of these contacts provided a reverse lend-lease supply of the East African Medical Journal which filled many of the gaps in this set. We also received particularly gracious letters of acknowledgment for duplicates which were dispatched through the Medical Library Association Exchange to the British Medical Association, the Gorgas Hospital Medical Library in the Canal Zone and the Medical College in Vellore.

A revision of the library rules was made during the year to formalize already established, and other desirable, changes in practice, and to cover such new conditions as those created by the contribution plan.

One of the constructive results which stemmed from the College's interest in the library's financial problems was the framing and circulation of letters soliciting the aid of some of the leading pharmaceutical and chemical concerns which spread the awareness of our need and which resulted in one very substantial contribution to our current operating budget.

The monthly Honorary Librarian's report was given wider circulation this year when it has been mimeographed and circulated to members of Council as well as to members of the Library Committee.

The loyalty of our staff and good counsel of our committee combined with the sympathetic reception of the library's problems by its many supporters gives promise of the ultimate expansion of the library's usefulness until its influence and service shall be enjoyed in all the parts of that vast enterprise which constitutes Philadelphia medical study, practice and research. The College library is now rendering service locally, nationally and internationally and it is ambitious to improve its capacities for this service and to extend it to larger numbers of users.

Historical Collections

As was widely publicized at the time of his death, the medico-historical library of our late president Dr Francis R. Packard was bequeathed to this institution, whose interests were very close to his heart for over fifty years. The collection numbers some 1,100 volumes and represents on the whole a medical historian's working tools rather than the collection of a bibliophile, in the restricted sense of the word. That is to say, it is particularly rich in the basic reference works and secondary authorities. But subjects which Dr Packard had himself undertaken to write on—such as Paré, Guy Patin, Rabelais, Larrey—are represented also in primary form. In the latter category, we especially welcomed the 1585 (4th) edition of Paré's *Oeuvres*, the last edition which Paré himself saw through the press and the first to contain the *Apologie et Traité*, of which a translation by Dr Packard appeared in his *Life* of Paré.

The acquisition of this collection, and the prospective acquisition of another, to be announced in our next annual report, points up anew the library's tragic lack of space for the proper housing, display, and use of its superb historical collections.

Vivorum donatorum nostrorum facile princeps remains another of our past presidents, Dr Edward B. Krumbhaar. From his gifted and gifting hands, and from those of Dr. J. Monroe Thorington, came a number of choice items, supplemented by others from other good friends, as follows:

16th Century

Aristotelis, Alexandri Aphrodisiei, Marci Antonii Zimare, ac philosophorum medicorumque conplurium problemata. Venice, 1554. *Gift of E. B. Krumbhaar, M.D.*

Bretonnayau, René. La generation de l'homme, et le temple de l'ame, avec autres oeuvres poëtiques extraittes de l'Esculape de René Bretonnayau. Paris, 1583. (Bound with the Quercetanus noted below.) *Gift of J. Monroe Thorington, M.D.*

Hippocrates. Opera omnia. Lyon, 1562. *Gift of an unidentified friend in Italy and of Mr Joseph Liguori, Philadelphia.*

Falloppius, Gabriel. Observationes anatomicae. Venice, 1561. *Gift of Frederick Fraley, M.D.*

Gesner, Conrad. Bibliotheca universalis. Geneva, 1545. *Purchased from Rare Book Fund.*

Quercetanus, Josephus. Le grand miroir du monde. Lyon, 1587. (Bound with the Bretonnayau noted above.) *Gift of J. Monroe Thorington, M.D.*

17th Century

Albertus Magnus. De secretis mulierum. Amsterdam, 1669. *Gift of E. B. Krumbhaar, M.D.*

Bartholinus, Casparus. De inauribus veterum syntagma. Accedit mantissa ex Thomae Bartholini miscellaneis medicis de annulis narium. Amsterdam, 1676. (Bound with the Thomas Bartholinus items noted below.) *Gift of E. B. Krumbhaar, M.D.*

Bartholinus, Thomas. De armillis veterum schedion. Accessit Olai Wormii De aureo cornu danico. Ed. novissima. Amsterdam, 1676. (Bound with the C. and T. Bartholinus items noted above and below.) *Gift of E. B. Krumbhaar, M.D.*

——. Antiquitatum veteris puerperii synopsis. Amsterdam, 1676. (Bound with the C. and T. Bartholinus items noted above.) *Gift of E. B. Krumbhaar, M.D.*

18th Century

Alpinus, Prosperus. De praesagienda vita et morte aegrotantium. Venice, 1751. *Gift of E. B. Krumbhaar, M.D.*

Bellini, Laurentius. Opera omnia. 3d ed. Venice, 1747. *Gift of E. B. Krumbhaar, M.D.*

Miscellaneous

[Rush, Benjamin.] Notes on Benjamin. Rush's lectures on pathology and therapeutics, taken by Joseph Galloway Shippen, ca. 1810. *Gift of Mr Edward Shippen Morris*

Osler, Sir William. Typewritten, signed, letter to James Tyson, Baltimore, Sept. 8, 1896. *Gift of William A. Jeffers, M.D.*

Collection of photographs of 19th century German physicians, with holograph letters

written by Wilhelm His, jr, Traube, Kussmaul, Ehrlich, Helmholtz, and Hitzig. *Gift of (the late) Frederic H. Lewey, M.D.*

Broadside: "A genuine description of the incomparable virtue & effects of the true Quinta essentia Solis, or Gold-tincture, prepared by John Sebastian Stephany, chymist at New-York. 1773." *Gift of Mr James E. Gibson.*

Fourteen volumes of prescriptions filled by the Philadelphia druggist F. Brown in the latter half of the 19th century. *Gift of the Free Library of Philadelphia.*

The two French poems bring into the Philadelphia area the only copies of two rarities that add importantly to our collection of medicated poetry. Physician to Henry IV, of France, and a first-rate quack (even in recent times some rulers have had an affinity for unconventional medical practioners, of course), Joseph du Chesne (Quercetanus) was a prolific author of unversified, as well as versified, medical works, and was no stranger to our hospitable collections. Bretonnayau's remarkable and lengthy poem (of sufficient rarity and interest to have been reprinted as recently as 1901), with the extracts from his *Esculape*, run the gamut from philosophical disquisitions on generation, conception, sterility, and the soul, to consideration of such mundane matters as the eye, the heart, and the liver, the constitutions (frenetic, melancholic), the gouts, cosmetology, and hemorrhoids.

The Hippocrates is, aside from its valuable text, an association item of an unusual and touching sort. The volume was sent to Mr Liguori by a friend in Italy with the request that it be given to an appropriate American library as a symbol of Italian gratitude for the liberation of Italy, "by the noble American nation", in the last war. "Names are nothing", our unknown benefactor wrote, "or the gesture loses its real significance." The real significance is neither lost nor lost on us; and it will be reanimated in the future whenever the book is opened by one of our readers.

Discoverer of several anatomical structures now associated eponymically with him, Fallopius published only one book in his life-time, this one, which contains a number of his original descriptions. While posthumous editions of his various writings were in the library, this one, with its unique authority, adds very importantly to the research value of our Falloppian dossier.

The Gesner adds, also belatedly, a prime monument in the history of medical and general bibliography. Our lack of a copy was pointed up in an exhibit on medical bibliography prepared in honor of Dr John F. Fulton's Rosenbach Lectures at the University of Pennsylvania. Before long we were advised by that limitlessly helpful friend of libraries that there reposed as a duplicate, in the Yale Historical Medical Library, a copy bequeathed to it by Dr Arnold C. Klebs, the noted medical bibliographer, and that it could be purchased at a price which, as it happened, bore a striking likeness to the modest balance in our Rare Book Fund. Thus this wonderful text comes to us with associational values that considerably enhance our pleasure in its acquisition.

The Osler letter (not in Cushing), to our onetime president "Urinary James" Tyson (a humorous Oslerite allusion to Tyson's urological work), runs as follows:

"Congratulations on the granddaughter, and give my warmest congratulations to the young folks.

"I do hope you will be able to get the book out by the first. I had a visit with Fitz, who is sweating and swearing in the most grievous manner. I don't think there is any possibility that they can get it out by the first of October."

Apparently the allusions are to Tyson's "Practice of Medicine", published in 1896, and Fitz and H. C. Wood's "Practice of Medicine", published in 1897. When one recalls that the second edition of Osler's own "Principles and Practice" was published in 1895, we find a curious and entertaining situation indeed: four good friends amicably entering the market-place at approximately the same time and offering the same standard article though cut and trimmed in individual fashion. Since Osler arrived first, the general

spirit of friendly rivalry speaks well for his generosity, even as it reminds us of the not uncommon fate of the prophet with whom we often break bread. Did Osler perhaps surmise what history was to show, that only one of the books would long endure?

The broadside advertisement of "the true Quinta essentia Solis, or Gold-tincture" brings us the earliest bit of Americana medica of its type that we have. It is Americana medica in a bibliographic sense, but almost timeless in another, because the general tone and even portions of the actual text reach centuries back to the beginnings of hermetic medicine and forward to the latest five-star edition of our contemporary newspapers. This tincture, we are advised, was also to be had in Philadelphia from The Messrs Henry and Peter Kurtz, "in second-street." Resident "in second-street" at this time (1773) was John Morgan, who did more than anyone else of his time to establish pharmacy as a distinct branch of medicine. One wonders whether Morgan sniffed scornfully as he passed the broadside in the window of his neighbors Kurtz, or whether—as his empirically-minded colleague Benjamin Rush probably did—he gave the quintessence-of-the-sun a skeptical try.

Historical Exhibits

Already referred to, in connection with the acquisition of Gesner's *Bibliotheca universalis*, the exhibit of medical bibliographies was our major exhibit of the year. It comprised 55 volumes, spanning the period 1506–1949. While exhaustive neither of the subject nor of the library's resources in the field, it was clearly indicative enough of both to arouse interest in a subject that remains one of the most important confronting the users of medical literature today.

The Section on Medical History's course of six lectures for medical students was, as usual, provided with special exhibits of significant and culturally interesting medical literature published in the successive chronological periods covered by the lectures. This year, mimeographed, briefly annotated lists of the books exhibited were made available to the students. The courtesy of the lecturers, Prof. Shryock and Dr Temkin, in calling attention to the exhibits immeasurably aided the library's efforts to suggest the opportunities for further study of the subject afforded by the library, and was greatly appreciated.

A special exhibit, on women in medicine, was prepared in honor of the Medical Women's International Association, whose 6th Congress was inaugurated with a session held at the College. Among the items of particular interest was the doctoral dissertation of Dorothea Erxleben (Halle, 1754), who was the first woman to obtain a medical doctorate from a German medical school.

Historical Publications

"Osler and Medical Library Practice" an article by the librarian, was published in the *North Carolina Medical Journal*, December, 1949. A review, from the same hands, of Philip Van Ingen's "The New York Academy of Medicine: Its First Hundred Years", appeared in the *New-York Historical Society Quarterly*, January, 1950.

The Staff

Mrs Bready, Mr Morse, and Mr McDaniel attended the 49th annual meeting of the Medical Library Association, held in Boston, in June, the last contributing a paper to the program. Mrs Bready served on the Association's Committee on Periodical and Serial Publications (to which she was re-appointed for the ensuing year) and took an active part in the committee's publication, *Check List of U.S.A. and Canadian Holdings of Austrian, Belgian, French and Italian Medical and Dental Periodicals, 1939–1948*. Mr Morse was appointed to the Exchange Committee, and Mr McDaniel was re-appointed to the Committee on Abstracting and Indexing.

Mrs Maines was treasurer of the Social Science Group and served on two other committees of the local chapter of the Special Libraries Association.

Miss Oswald is continuing her studies at the Drexel Library School.

Mr Morse served as president of the local chapter of the Special Libraries Association and represented it at the annual meeting of the Association, held in Atlantic City.

Mr McDaniel attended the annual meeting of the Association of Honorary Consultants to the Army Medical Library, held in Washington. A note on his publications appears in the section on historical acquisitions and activities.

The administrative assistant librarian and the librarian record with deep appreciation the much, effective work performed by the other members of the staff under numerous handicaps.

The staff roster, as of 31 October 1950, follows:

Librarian
W. B. McDaniel, II

Administrative Assistant Librarian
Elliott H. Morse

Head Cataloguer
Miss Janet F. Oswald

Assistant in Charge of the Reading Room
Mrs Maud G. Maines

Assistant in Charge of the Periodicals Room
Mrs Elizabeth F. Bready

Assistant Cataloguer
Miss Gertrude C. Cirotti

Secretary to the Librarians and General Assistant
Miss Kathryn E. Haegele

Photostat Operator and Page
Miss Cynthia Delgado

Pages
Miss Lillian Ceci
Miss Patsy Smith
Miss Theresa Tierno
Miss Louise Winkler

Statistical Summary

INVENTORY

	1950		1949	
Total number of accessioned[1] items		173,450		171,275
	1950		1949	
Incunabula	416		416	
Manuscripts (including a few typescripts)	741		723	
General	172,293		170,136	
	173,450		171,275	
Total number of unaccessioned[1] items		325,446		324,278
Reports	26,875		26,824	
Periodicals "reserve"[2]	8,186		7,846	
Theses and Dissertations	55,177		53,590	
Pamphlets	235,208		235,018	
	325,446		324,278	
Total number of current periodical publications regularly received		1,477		1,346
Portraits[3]		76,617		73,827

[1] Our 'accessioned item', or 'volume', normally contains not fewer than 100 pages, usually is bound, and always is catalogued. It may comprise a part of a 'book' or periodical 'volume', one or more complete 'books' or periodical 'volumes', a collection of reports, pamphlets, or theses. In a few instances, the term applies to miscellaneous items such as a photograph album or a large collection of correspondence or private papers.

The 'unaccessioned item' is intended to apply to (usually unbound) pamphlets, reports, theses, or other material of fewer than 100 pages; only a part of this material is catalogued. It should be stressed, however, that in this category are included uncounted thousands of reports and theses of 100 pages or over, as well as smaller classic items, which would quite properly figure in the 'number of volumes' claimed by other libraries, and which would indeed figure among our 'accessioned items', had our predecessors and we ever been able to accession and catalogue them.

[2] More-or-less complete duplicate volumes of periodicals.

[3] Including 118 oil, and 422 other, framed portraits in the care of the Committee on College Collections. The count of portraits represents the number of entries on the cards in the portrait catalogue. The entries represent, in turn, both loose portraits and those in books, many of them, of course, being merely different reproductions of a single original.

DISTRIBUTION OF THIS MATERIAL

	Accessioned Items	Unaccessioned Items
General Library (including the Lewis Library)	169,156	325,442
On permanent deposit:		
Gross Library	3,877	4
Parry Library of the Obstetrical Society of Philadelphia	217	0
Mütter Museum[4]	200	0
	173,450	325,446

CURRENT PERIODICALS

	Purchased	Exchange or Gratis	Total
U.S.A.	298	324	622
Western European Continent	474	37	511
Latin America	33	83	116
United Kingdom and Eire	111	31	142
Canada	4	25	29
Eastern European Continent	16	4	20
Asia	6	8	14
Africa	4	7	11
Pacific	3	9	12
Grand Total: 1950	949	528	1,477
Grand Total: 1949	838	508	1,346

New titles: A total of 70 periodicals was added in 1949–50. Fifty-five of these were purchased, 15 received in exchange or gratis. Forty-nine began with volume 1.

Separate Issues received, checked-in on the cards, and shelved totaled 14,178. In addition, thousands of duplicate issues were received, as usual; 340 of these were retained for our 'reserve' files, no attempt being made to count those held merely for exchange or other use.

Visitors to the Norris Room for the year totaled 4,511.

Reader's Use of the Library

Library Hours. The library was open, during the academic year, from 9:30 to 9:30 on Mondays and Wednesdays; from 9:30 to 5:30 on the other weekdays. During the latter half of June (except for 3 days when the library was closed for repairs), in July, August, and the first half of September the library was open from 1 to 9:30 on Wednesdays; from 9 to 5 on the other weekdays, except Saturdays, when it was closed. The following legal holidays were observed: Thanksgiving (beginning at 5:30 on the preceding evening), Christmas and New Year's (and 1 day preceding each), Independence, and Labor Days.

Number of visitors:

			Totals	
	1950	1949	1950	1949
Days (including evenings)	(289)	(287)	10,145	12,014
Circulation of books:				
Number of volumes taken out			7,172	6,835
(Books: 2,471; Periodicals: 4,901)				
Number of volumes consulted in the library[5]			57,294	60,707

Inter-library loans: The library sent 1,754 volumes on inter-library loan to 100 libraries in 21 States and Canada and has borrowed 19 volumes from 1 library.

Photostats: 3,196 photostatic prints were furnished on request (1949: 2,220).

[4] The books of the Mütter Museum are not permitted to be removed from the College building.

[5] The number of volumes "consulted in the library" includes only those supplied on demand. Readers have access to the bound volumes of periodicals and reference works kept on the shelves in the Reading Room; the Fellows, and occasionally others, by special permission, have access to the book-stacks. There are, therefore, many volumes consulted of which no accurate record can be kept.

Acquisitions and Accessions

Accessioned Acquisitions:

1950: 2,175 volumes (1,452 by purchase; 551 by gift; 172 by exchange). (*Books:* 740; *Periodicals:* 1,435).

1949: 2,350 volumes (1,513 by purchase; 656 by gift; 181 by exchange). (*Books:* 858; *Periodicals:* 1,492).

Non-accessioned Acquisitions[6]: 383 Pamphlets (1949: 315); 51 Reports (1949: 75); 1,587 Theses (1949: 629).

Donations

The donors for the past year number 241. The library is indebted for large gifts of books, pamphlets, and unbound periodicals to the following donors: Dr S. Bellet; Blakiston Co.; H. M. Buten; Dr K. Chouké; Division of Pharmacy, University of California School of Medicine; Drs W. A. N. Dorland, E. B. Krumbhaar; Lea & Febiger; Smith, Kline & French Laboratories; Dr I. J. Wolman; Wyeth, Inc.

Various publishing houses have presented volumes as follows: Blakiston Co., 18; F. A. Davis Co., 4; Lea & Febiger, 37; J. B. Lippincott Co., 22; W. B. Saunders Co., 59.

Other individual donors were as follows: Mrs Barnard; Drs A. J. Bedell (through Section on Ophthalmology), H. Beerman, F. Beekman; Prof. W. J. Bell, Jr.; Drs J. E. Berk, N. Blumberg, J. Bordley, 3rd, W. G. Bowerman, W. N. Bradley, M. E. Brown, C. C. Burlingame, B. Chance; Prof. F. Cordasco; Drs L. L. Corielle, A. R. Crane, D. M. Davis, F. G. Dickinson, P. Dufault, M. S. Ersner; Mrs A. A. Eshner; Dr F. Fraley; J. E. Gibson; Drs B. Gordon, A.-R. Hassan; S. F. Houston; Drs J. H. Hutton, C. Jackson, C. L. Jackson, A. C. Jacobson, A. E. Jones; A. P. Karsh, Ph.G. (through Dr R. J. Hunter); T. E. Keys; Drs J. A. Kolmer, P. Lazarus, C. Leake, Dr R. M. LeComte (through Dr C. A. W. Uhle); W. R. LeFanu; R. Lentz; Drs F. H. Lewey, W. Long; W. B. McDaniel, 2d; Drs C. Macfarlane, T. H. McGavack, T. G. Miller, O. T. Messelt, C. D. O'Malley, H. W. Orr, W. Overholser, G. H. J. Pearson, H. Pettit, G. E. Pfahler, E. Rosencrantz, I. H. Rubenstein, K. F. Russell, M. Saltzman, L. C. Scheffey, T. G. Schnabel, E. Shorr, G. N. J. Sommer, J. M. Thorington; Mrs J. C. Trent; Drs W. P. Vail, D. D. Van Slyke, A. L. de Venturino, W. S. Wadsworth, W. Zentmayer.

Exchanges

The *Transactions & Studies* was sent, either in exchange or as gift, to 240 organizations.

The library received a number of journal issues through the Medical Library Association Exchange and supplied duplicate journals to other libraries through MLA and UNESCO.

Theses and dissertations to the number of 1,587 have been received on exchange from the following European schools of medicine: Universities of Amsterdam, Basel, Berlin, Bern, Copenhagen, Geneva, Giessen, Göttingen, Heidelberg, Jena, Lausanne, Louvain, Lund, Rostock, Uppsala.

[6] As usual, not all the pamphlets, theses, and numbers of various journals listed as received had been checked for keeping or discard at the close of the library year.

Work of the Cataloguers

	1950	1949
Accessioned items catalogued or recatalogued	767	653
Unaccessioned pamphlets and Fellows' reprints catalogued by author or by author and subject	156	387

Approved:
Truman G. Schnabel
Chairman

W. B. McDaniel, 2d
Librarian
Elliott H. Morse
Administrative Assistant Librarian

Annual Report of the Committees on the Mütter Museum and College Collections

The Museum

The Mütter Museum was open to Fellows of the College, physicians and the general public on days when the College building was open, from 10:00 to 1:00 and from 2:00 to 5:00, except Saturdays when it was open from 9:30 to 1:00. It was open on the evenings of the Stated Meetings of the College until 8:30. There were 1167 visitors to the museum during the year.

The Sixty-second Thomas Dent Mütter Lecture was given February 1, 1950, by J. H. Comroe Jr., M.D., who spoke on *The Value of Pulmonary Function Tests in the Diagnosis of Pulmonary Disease.* The lecture was published in the June, 1950, issue of *Transactions & Studies* of the College.

The Sixty-third Thomas Dent Mütter lecture was given November 1, 1950, by Seymour S. Kety, M.D., who spoke on *Blood Flow and Metabolism of the Human Brain in Health and Disease.*

A supplement to the *Catalogue of the Mütter Museum* was completed, showing the list of donors and the specimens donated by them, and was published in the June, 1950, number of the College's *Transactions & Studies.*

Mrs. Ella N. Wade was reappointed curator and clerk-technician for the year 1949–1950.

Accessions to the permanent collection of the Mütter Museum for the year, and falling under the provisions of the Mütter Deed of Gift, are as follows:

Presented by Dr. Alfred C. Wood:

Sea sponges used in intra-abdominal operations before surgical gauze was introduced. Used by Dr. J. William White and in possession of Dr. Wood for thirty-three years.

Presented by Mr. W. Ward Beam:

One hundred lantern slides of illustrations shown in *Regional Anatomy and its Relation to Medicine and Surgery* by George McClellan, M.D., and formerly the property of Dr. McClellan.

Presented by Mr. Walter Bonsall, Jr.:

Skull from the Island of Mallicollo in the New Hebrides, used for religious purposes.

O. V. Batson
Chairman

The College Collections

Mrs. Ella N. Wade was reappointed custodian of College Collections.

A catalogue of the oil portraits in the College was published in the June, 1950, number of the College's *Transactions & Studies.*

During the year the portrait of Oliver Wendell Holmes was cleaned and varnished and a new legend attached to the S. Weir Mitchell portrait by Dvorak.

The members of the City History Society of Philadelphia visited the College for the purpose of viewing the portraits and to learn something of the history of its founding.

Accessions to College Collections were as follows:

Presented by Dr. Joseph D. Aronson:

Two bronze medals: Albert Calmette; Louis Pasteur

Presented by Dr. J. Monroe Thorington:

Button worn by Dr. James Thorington during World War I, designating physicians not in the armed services.

Instrument for venesection, ca. 1830, from Samedan, Engadine, Switzerland.

Set of Gruber's ear specula in a wooden case

Presented by Dr. J. Monroe Thorington and Mr. Richard W. Thorington:

Surgeon's badge formerly worn by Dr. James Thorington during his service with the Panama Railroad, 1881–1889

Presented by Dr. Burton Chance:

Ophthalmoscope used by Dr. Charles H. Thomas

Two Noyes' ophthalmoscopes used by Dr. William Thomson

Two unidentified ophthalmoscopes

Twelve eye specula: Charriere's; Noyes'; Graefe's; Liebreich's; Cappez's; Foveaux's; Ziegler's; Schmidt-Rimpler's; Kelley-Snowden's; three unidentified

Six lid elevators: two Pellier's; one Jaeger's; two Walton's; one Desmarre's

Guthrie's fixation hook

Presented by Dr. Philip M. Gottlieb:

Clinical thermometer dated 1886

O. V. Batson
Chairman

Annual Report of the Publication Committee

THIS report covers the four numbers of the *Transactions & Studies* published within the College's fiscal year ending 10 November 1950: namely, vol. 17, nos 3 and 4; vol. 18, nos 1 and 2.

The four issues contained a total of 176 pages, as against the 206 pages contained in the four issues immediately preceding.

Prof. Ian Aird's Newbold Lecture was not made available. The joint meeting with the Philadelphia County Medical Society was a symposium whose component papers were scheduled to appear in *Philadelphia Medicine* before they could have been printed in the *Transactions & Studies*. Dr Hench's Hatfield Lecture was received too late for publication in the series of numbers under review. It may be pointed out again that the four issues are spaced at intervals designed to afford prompt publication for the series of scientific lectures; and that the scientific interest of each issue depends chiefly on the availability, and prompt availability, of the two or three scientific lectures delivered in the intervals between issues.

The only innovation attempted in this series of issues was the publication (April, 1950, issue) of the membership lists of the Sections. Undertaken at the suggestion of the clerk of the Section on Medical History, Dr Samuel X Radbill, and of course with the essential and cordial coöperation of the clerks of the other Sections, this additional record of the Fellows' participation in the work of the College immediately established itself as a stimulating and useful one, both for current and historical considerations.

The *Transactions & Studies* again afforded a convenient and appropriate medium of publication for the proceedings of the Pathological Society of Philadelphia, whose meetings are held at the College. There would seem to be no reason why others of the local special societies using the College's facilities should not likewise provide themselves with a permanent public record of their proceedings.

It is a pleasure for the editor to acknowledge his debt to the College officers and the officers of the Sections for their ready coöperation in providing him with the information and other data required. Dr William A. Jeffers' ability to produce, on time, abstracts of the presentations before the Section on General Medicine has been especially appreciated.

A summarized financial statement follows:

Receipts		
Appropriation	$1,400.00	
Income from publication funds	693.49	
Sale of *T & S* and reprints	109.99	
Pathological Soc. of Phila.	51.00	$2,254.48
Expenditures		
Printing, mailing, reprints	$1,915.70	
Envelopes	89.80	
Stenciling envelopes	20.80	
Secretarial assistance	40.00	
Editorial office (postage)	20.00	2,086.30
Balance		$ 168.18

Approved:
DAVID A. COOPER
Chairman

W. B. MCDANIEL, 2D
Editor

Annual Reports of the Sections*

Medical History

There were 90 paid-up members enrolled in the Section during the year, the most active one the Section has had since the war.

This year the Woman's Medical College of Pennsylvania celebrated the centennial anniversary of its founding. With the support of the Kate Hurd Mead Class of 1888 Fund, the Section and the Woman's Medical College sponsored three lectures at the Hall of the College of Physicians, delivered, respectively, by Dr. O. H. Perry Pepper, Fellow and past president of the College of Physicians; Dr. W. R. Bett, of London; and Prof. Richard Shryock, director of the Institute of the History of Medicine, Johns Hopkins University. The total attendance for these lectures surpassed 950. Dr. Pepper's lecture was published in the April, 1950, number of our *Transactions & Studies*. Dr. Bett's lecture was preceded by a reception at the home of Dr. and Mrs. William G. Leaman, Jr., both of whom have given loyal support to the Section. Preceding Prof. Shryock's lecture, a reception was tendered by Dr. and Mrs. Leaman at their home and was followed by a subscription dinner at the Rittenhouse Club, arranged by Dr. Russell S. Boles, a member of the Section.

With the active support of the deans of the medical schools of Philadelphia, a course of six weekly lectures on medical history was given, at the College, for medical students, running from October 30 through December 4. Three lectures each were given by Prof. Shryock and Dr. Owsei Temkin, both from the Institute of the History of Medicine. The total attendance was 1,381, with an average of 230. The average more than doubled last year's average of 106, when the attendance total was 1,063 for the course of ten lectures.

Presided over successively by Dr. T. Grier Miller, president of the College, and the deans of the medical schools, the lectures were given from 7:00 to 8:00 pm.. The library was open during these evenings, and the librarian prepared exhibits pertinent to the subject matter discussed during the hour. These lectures were given wide publicity, were noted in the public press and announced in the current catalogues of the Woman's Medical College and Temple University School of Medicine. Preceding the lecture of November 27th, the College arranged a subscription dinner, inviting six distinguished citizens from this community as lay guests.

After a wartime lapse in its membership, the Section was re-elected to Constituent Society membership in the American Association of the History of Medicine. As the delegate of the Section, the clerk attended the annual meeting of the Association in Boston. His report on the Section's activities in 1949 elicited an interesting discussion on the subject of teaching medical history to the medical students, with the result that Dr. Shryock and others were appointed to arrange a future conference on the teaching of medical history. This was held at the Institute of the History of Medicine, Baltimore, December 1, 1950. Drs Herbert T. Kelly, Maurice S. Jacobs, William G. Leaman, Jr., J. Harold Austin and E. B. Krumbhaar, all members of the Section, attended.

There is a growing interest in the affairs of the Section and in attempting to carry out its various activities, the Section is aiming at certain objectives: namely, to bring to the attention of the medical profession in Philadelphia and elsewhere the resources and uses of the College of Physicians of Philadelphia for the benefit of the public at large; to foster the study of medical history and the medical humanities and to serve as a common meeting ground for all interested in the history of medicine.

Special thanks are due to Dr. William G. Leaman, Jr., for his unceasing efforts in

* For the programs of the Sections in 1950, see the *Transactions & Studies*, June, 1950; February, 1951.

furthering the interests of the Section and to Mr. McDaniel not only for the carefully planned exhibits but for his constant help and advice.

SAMUEL X RADBILL
Clerk

OPHTHALMOLOGY

The total membership in the Section is 63, of whom 60 have paid their dues. There will have been seven meetings held during the year. The average attendance for the first six meetings was 126; the scheduled seventh meeting comes shortly after submission of this report.

The Thirteenth Annual de Schweinitz Lecture was delivered by Dr. Parker Heath of Boston, Mass., on November 16th.

The Zentmayer Prize was awarded to Dr. William O. LaMotte, Jr., and Dr. George S. Tynor (by invitation) for their paper, "Observations on Retrolental Fibroplasia".

M. LUTHER KAUFFMAN
Clerk

OTOLARYNGOLOGY

During 1950 the Section held five meetings, including the December meeting still to be held as this report is written. The April and October meetings were cancelled due to the dates conflicting with other medical society activities and the inability to secure a satisfactory date near the usual time. The March meeting, held at the College, was a joint meeting with the Section on Otolaryngology of the New York Academy of Medicine. Twenty-nine members of the New York Section attended this joint meeting.

For the first four meetings there was an average attendance of 23 Section members and 47 guests.

The Section has at the present 59 members and 3 honorary members.

M. VALENTINE MILLER
Clerk

PUBLIC HEALTH, PREVENTIVE AND INDUSTRIAL MEDICINE

The Section held two meetings in 1950. At the first, a panel discussion on the subject "Report of the Pennsylvania Health Survey", Dr. Pascal Lucchesi gave a resumé of the original purpose and results of the Survey. Dr. W. Benson Harer discussed personnel administration in the State, and Miss Louisa Eskridge spoke on local health services. Mr. Clyde Arbegast discussed methods of arousing citizens' interest in the Survey in order to publicize it. Dr. Ruth H. Weaver discussed matters pertaining to maternal and child health in Pennsylvania. The meeting was attended by ten persons and the members of the panel.

The subject of the second meeting was "Tuberculosis". Dr. David A. Cooper reported on the results in studies on the incidence of tuberculosis in student nurses in various hospitals within the City of Philadelphia as determined by tuberculin testing and chest X-rays. This report is part of a general survey which was made in cooperation with the United States Public Health Service. Dr. Joseph D. Aronson spoke on control measures, particularly the role of B.C.G. immunization in the control of tuberculosis. The meeting was attended by fourteen persons in addition to the participants.

The Section had a membership of 32.

A. C. LABOCCETTA
Clerk

List of Endowed Lectures, 1938-1950*

ALVARENGA PRIZE AND LECTURESHIP

1938	XXXIII	Richard Shope
1939	XXXIV	Harry Goldblatt
1940	XXXV	Ernest W. Goodpasture (Lecture I)**
1941	XXXVI	John J. Bittner (Lecture II)**
1942	XXXVII	Edwin J. Cohn (Lecture III)**
1943	XXXVIII	Ernest Carroll Faust (Lecture IV)**
1944	XXXIX	Gervase J. Connor
1945	XL	Alexander S. Wiener (Lecture V)**
1946	XLI	William H. Feldman (Lecture VI)**
1947	XLII	Joseph D. Aronson (Lecture VII)**
1948	XLIII	Melvin H. Knisely (Lecture VIII)
1949	XLIV	Owen H. Wangensteen (Lecture IX)**
1950	XLV	Ephraim Shorr (Lecture X)

JAMES M. ANDERS LECTURES

1938	XIII**	Homer F. Swift and Alfred E. Cohn
1939	XIV**	R. E. Dyer
1940	XV**	Charles Armstrong
1941	XVI**	Thomas Francis, Jr.
	XVII**	Henry F. Vaughan
	XVIII**	John B. Youmans
1942	XIX**	Arlie V. Bock
	XX	Francis G. Blake
1946	XXI**	John H. Dingle
1947	XXII	Wilson G. Smillie
1948	XXIII**	Ernest L. Stebbins
1949	XXIV**	George Baehr

* Supplementing the list published in the Transactions 4th ser. 5: 63–66, 1937.

** Published in the *Transactions & Studies*.

NATHAN LEWIS HATFIELD PRIZE AND LECTURESHIP

1938	XIX	Warfield T. Longcope
	XX	Charles H. Best
1939	XXI**	Walter Bauer
	XXII**	C. N. H. Long
1940	XXIII**	Robert B. Osgood
	XXIV	George W. Corner
1941	XXV**	George L. Streeter
1942	XXVI**	Clive M. McCay
1943	XXVII**	Paul C. Colonna
1944	XXVIII**	John A. Toomey
1945	XXIX**	Chester S. Keefer
1946	XXX**	Harry Eagle
1947	XXXI**	George R. Minot
1948	XXXII**	Cecil James Watson
1949	XXXIII	Allan M. Butler
1950	XXXIV**	Philip S. Hench

THOMAS DENT MÜTTER LECTURES

1938	LI**	William Boyd
1939	LII**	Howard T. Karsner
1940	LIII**	Allen O. Whipple
1941	LIV**	Walter Lincoln Palmer
1942	LV**	H. Winnett Orr
1943	LVI**	Virgil H. Moon
1944	LVII**	Stanley P. Reimann
1946	LVIII*	Joseph Stokes, Jr.
	LIX**	O. H. Perry Pepper
1948	LX**	Balduin Lucké
1949	LXI**	John H. Gibbon, Jr.
1950	LXII**	Julius H. Comroe, Jr.
	LXIII**	Seymour S. Kety

BENJAMIN MUSSER LECTURES

1942	I**	J. H. Musser
1944	II**	John F. Enders
1946	III**	Richard H. Shryock
1950	IV**	James Bordley, III

S. WEIR MITCHELL ORATIONS

1938	VII**	Detlev W. Bronk
1940	VIII**	J. F. Fulton
1941	IX	Robert Dick Gillespie
1948	X**	Nolan D. C. Lewis
1949	XI**	Thomas A. C. Rennie
1950	XII**	Lauren H. Smith
		Winfred Overholser

MARY SCOTT NEWBOLD LECTURES

1938	XL**	Harry Goldblatt
	XLI**	Russell M. Wilder
1939	XLII**	W. B. Castle
	XLIII**	Claude S. Beck
	XLIV**	William J. Kerr
	XLV	Alfred Blalock
1940	XLVI**	Tom Douglas Spies
	XLVII**	Alvin F. Coburn
	XLVIII	Francis J. W. Roughton
		Arthur Parker Hitchens
1941	XLIX**	Thomas T. Mackie
1942	L	E. D. Adrian
	LI**	René J. Dubos and Rollin D. Hotchkiss
	LII**	C. Sidney Burwell
1943	LIII**	Carl F. Schmidt
1944	LIV**	Eugene M. Landis
1945	LV**	Charles C. Wolferth
	LVI	John Alexander
1947	LVII**	Robert E. Gross
	LVIII	Frank W. Hartman
1948	LIX	Murray J. Shear
	LX**	Laurence H. Snyder
1949	LXI	Albert B. Sabin
	LXII	Ian Aird
1950	LXIII	Frederick A. Coller

List of College Lectures, 1950

4 January 1950

SMITH, LAUREN H. An Ideal Program for Mental Health in Philadelphia. (S. Weir Mitchell Oration XII, *a*, printed in the *Transactions & Studies*, April, 1950.)

OVERHOLSER, WINFRED. Some Psychiatric Aspects of Delinquency. (S. Weir Mitchell Oration XII, *b*, printed in the *Transactions & Studies*, April, 1950.)

1 February 1950

COMROE, JULIUS H. The Value of Pulmonary Function Tests in the Diagnosis of Pulmonary Disease. (Thomas Dent Mütter Lecture LXII, printed in the *Transactions & Studies*, June, 1950.)

8 March 1950

Symposium: The Present Status of Hormone Therapy in Rheumatoid Arthritis, JOSEPH L. HOLLANDER, *chairman*. JOHN LANSBURY: Endocrine Aspects of Rheumatoid Arthritis. RICHARD T. SMITH: Androgen and Pregnenolone Therapy in Rheumatoid Arthritis. DONALD R. FITCH: Effect of Newer Steroids on Synovial Membrane Permeability and on Rheumatoid Arthritis. JOSEPH L. HOLLANDER: Experiences with Cortisone and ACTH Therapy in Rheumatoid Arthritis. (Joint meeting with the Philadelphia County Medical Society.)

19 April 1950

HENCH, PHILIP S. The Antirheumatic Effects of Cortisone and Pituitary ACTH. (Nathan Lewis Hatfield Lecture XXXIV, printed in the *Transactions & Studies*, December, 1950.)

3 May 1950

BORDLEY, JAMES, III. The Hospital in the Rural Community. (Benjamin Musser Lecture IV, printed in the *Transactions & Studies*, June, 1950.)

4 October 1950

SHORR, EPHRAIM. The Roles of Renal and Hepatic Vaso-active Principles in Shock and Hypertension. (Alvarenga Prize Lecture X, to be printed in the *Transactions & Studies*.)

1 November 1950

KETY, SEYMOUR S. Blood Flow and Metabolism of the Human Brain in Health and Disease. (Thomas Dent Mütter Lecture LXIII, printed in the *Transactions & Studies*, December, 1950.)

6 December 1950

COLLER, FREDERICK A. The Use and Abuse of Parenteral Fluids. (Mary Scott Newbold Lecture LXIII.)

Fellows

December 31, 1950

ELECTED

1948. Adelizzi, Richard A., 1723 S. Broad St.
1926. Adler, Francis Heed, 313 S. 17th St.
1949. Aegerter, Ernest E., 3400 N. Broad St.
1914. Aiken, Thomas G., Berwyn, Pa.
1936. Alexander, Fay Knight, Germantown Professional Bldg., Greene and Coulter Sts.
1947. Allbritten, Frank F., Jr., 1025 Walnut St.
1906. Allen, Francis Olcott, Jr., Secane, Pa.
1932. Allen, Frederick H., 1711 Fitzwater St.
1935. Alpers, Bernard J., 111 North 49th St.
1905. Anspach, Brooke M., 116 Mill Creek Rd., Ardmore, Pa.
1930. Appel, Kenneth E., 111 N. 49th St.
1905. Appleman, Leighton Francis, 308 S. 16th St.
1935. Armitage, George L., 400 E. 13th St., Chester, Pa.
1922. Arnett, John H., 2116 Pine St.
1942. Aronson, Joseph D., Henry Phipps Institute, 7th and Lombard St.
1920. Astley, G. Mason, 812 N. 63rd St.
1944. Atkins, Joseph P., 1201 Knox Rd., Wynnewood, Pa.
1935. Atlee, John L., Jr., 37 E. Orange St., Lancaster, Pa.
1914. Austin, J. Harold, 19 S. 22nd St.
1935. Bach, Theodore F., 1900 Rittenhouse Sq.
1942. Bachman, Carl, Univ. of Pa. Hospital.
1937. Bacon, Emily P., 1930 Chestnut St.
1946. Baker, Walter W., 255 S. 17th St.
1916. Balentine, Percy L., 407 Weightman Bldg., 1524 Chestnut St.
1940. Barba, Philip S., 222 W. Harvey St.
1943. Barden, Robert P., 3400 Spruce St.
1911. Barnard, Everett P., 1820 Rittenhouse Sq.
1939. Barnshaw, Harold D., 406 Cooper St., Camden, N. J.
1939. Bartle, Harvey Jr., 133 S. 36th St.
1931. Bates, William, 2029 Pine St.
1932. Batson, Oscar V., 3502 Hamilton St.
1921. Bauer, Edward L., 1609 Spruce St.
1933. Bauer, John T., 312 E. Second St., Moorestown, N. J.
1939. Baumann, Frieda, 1930 Chestnut St.
1908. Beardsley, E. J. G., 1919 Spruce St.
1930. Beardwood, Joseph T., Jr., 2031 Locust St.
1949. Beecham, Clayton T., Greene & Coulter Sts.
1935. Beerman, Herman, 2422 Pine St.
1942. Behrend, Albert, 255 S. 17th St.
1945. Behrend, Bernard, 5910 Greene St.
1934. Behrend, Moses, 255 S. 17th St.
1949. Beizer, Lawrence H., 255 S. 17th St.
1930. Belk, William Parks, Times Medical Bldg., Ardmore, Pa.
1936. Bell, Benjamin Tertius, Abington Memorial Hospital, Abington, Pa.
1947. Bellet, Samuel, 2021 Spruce St.
1943. Berk, J. Edward, 255 S. 17th St.
1941. Bernstein, Mitchell, 1321 Spruce St.

LIBRARY OF THE
COLLEGE OF PHYSICIANS
OF PHILADELPHIA

1937. Bertolet, J. Allen, 1530 Locust St.
1934. Biddle, Sydney Geoffrey, 255 S. 17th St.
1918. Billings, Arthur E., 2020 Spruce St.
1917. Birdsall, Joseph C., 139 Booth Lane, Haverford, Pa.
1949. Bishop, Edward H., 255 S. 17th St.
1933. Bishop, Paul A., Pennsylvania Hospital.
1944. Blady, John V., 340 Fishers Rd., Bryn Mawr, Pa.
1917. Block, Frank B., 136 S. 16th St.
1949. Blumstein, George I., 1614 Locust St.
1929. Bockus, Henry L., 250 S. 18th St.
1928. Boles, Russell S., Rittenhouse Plaza.
1923. Bond, Earl D., 111 N. 49th St.
1911. Bonney, Charles W., 255 S. 17th St.
1948. Bookhammer, Robert S., 2031 Locust St.
1931. Bortz, Edward Le Roy, 2021 W. Girard Ave.
1921. Borzell, Francis Frank, 4940 Penn St.
1936. Bostwick, Delazon Swift, 106 Linwood Ave., Ardmore, Pa.
1928. Bothe, Albert E., 255 S. 17th St.
1928. Bothe, Frederick A., 255 S. 17th St.
1947. Bourland, Henry S., 2029 Delaney St.
1923. Bower, John O., 2008 Walnut St.
1942. Bowie, Morris A., Rosemont, Pa.
1925. Boykin, Irvine M., 136 S. 16th St.
1907. Bradley, William Nathaniel, 1725 Pine St.
1942. Branen, William, Whitby & Cypress Ave., Yeadon, Pa.
1921. Bransfield, John W., 2101 Spruce St.
1948. Braun, William, 406 Cooper St., Camden, N. J.
1946. Briscoe, Clarence Conway, 255 S. 17th St.
1948. Brogan, Edmund James, 255 S. 17th St.
1917. Bromer, Ralph S., 318 Milbank Road, Bryn Mawr, Pa.
1936. Brown, Charles L., 1030 Indian Creek Rd.
1936. Brown, Clark E., Lankenau Hospital.
1932. Brown, Claude P., 1930 Chestnut St.
1939. Brust, Raymond W., 4710 Chester Ave.
1930. Bucher, Carl Joseph, The Westbury, 15th & Spruce Sts.
1943. Buerki, Robin C., University of Pa.
1928. Burden, Verne G., 255 S. 17th St.
1940. Burnett, W. Emory, 3401 N. Broad St.
1941. Butler, Miriam, 1930 Chestnut St.
1906. Butler, Ralph, 47th & Pine Sts.
1907. Cadwalader, Williams B., 133 S. 36th St.
1928. Campbell, Edward H., 133 S. 36th St.
1944. Campion, Richard J., Penllyn Rd., Springhouse, Ambler, Pa.
1931. Cantarow, Abraham, 1025 Walnut St.
1935. Carey, Lawrence S., 330 S. 9th St.
1931. Cariss, Walter L., 2043 Walnut St.
1930. Carpenter, Chapin, 1930 Chestnut St.
1905. Carpenter, Herbert B., 1805 Spruce St.
1926. Carpenter, Howard Childs, 1805 Spruce St.
1917. Carson, John B., 1802 Pine St.
1922. Case, Eugene A., 63 W. La Crosse Ave., Landsdowne, Pa.
1937. Castallo, Mario A., 1621 Spruce St.
1943. Castigliano, S. Gordon, 1012 Hampstesd Rd., Penfield Downs, Del. Co., Pa.

1949. Caswell, H. Taylor, Greene & Coulter Sts.
1933. Chamberlain, W. Edward, Temple University Hospital.
1939. Chamberlain, George W., Reading Hospital, Reading, Pa.
1950. Chamberlain, Richard H., 3400 Spruce St.
1900. Chance, Burton, 317 S. 15th St.
1945. Chance, Burton, Jr., 1726 Spruce St.
1948. Chapman, John P., Lincoln-Liberty Building.
1950. Chapple, Charles C., 570 E. Evergreen Ave., Chestnut Hill, Pa.
1939. Charr, Robert Kyun Hyun, 2038 Locust St.
1941. Cheleden, John, 255 S. 17th St.
1947. Chouké, Kehar S,.4111 Walnut St.
1945. Cianfrani, Theodore, 1930 Chestnut St.
1939. Ciccone, Emmet F., 2021 Murray St.
1929. Clark, Eliot R., 315 S. 41st St.
1934. Clark, Jefferson Hamer, 101 Maple Ave., Wyncote, Pa.
1947. Clark, Thomas Williams, 400 E. Willow Grove Ave.
1947. Classen, Charles H., Cushman Rd. and Lancaster Ave., Rosemont, Pa.
1926. Clerf, Louis H., 1530 Locust St.
1910. Cloud, J. Howard, 111 St. Pauls Road, Ardmore, Pa.
1903. Coates, George Morrison, 1721 Pine St.
1908. Codman, Charles A. E., S.E. Corner 42d and Spruce Sts.
1941. Cohen, J. Gershon, 255 S. 17th St.
1949. Cohen, Louis, 255 S. 17th St.
1949. Cohen, Louis B., 1320 Arrott St.
1907. Cohen, Myer Solis-, 2110 Spruce St.
1934. Colgan, Robert C., Bridgeport, Pa.
1934. Collins, Leon Howard, Jr., 133 S. 36th St.
1943. Colonna, Paul C., Univ. of Pa. Hospital.
1949. Conger, Kyril B., 3401 N. Broad St.
1945. Coonel, Pauline, 47 E. Mt. Pleasant Ave.
1930. Cooper, David A., 1520 Spruce St.
1947. Coppolino, John F., 1807 S. Broad St.
1941. Cornelius, Chalmers E., 119 Summit Ave., Jenkintown, Pa.
1911. Cornell, Walter S., Board of Public Education, Parkway and 21st St.
1945. Corrigan, Patrick H., 1720 S. Broad St., Trenton, N. J.
1914. Corson, Edward F., 136 S. 16th St.
1946. Costello, Thomas J., 131 Pennsylvania Avenue, Bryn Mawr, Pa.
1924. Cowan, Alfred, 1930 Chestnut St.
1940. Cowan, Thomas H., 1930 Chestnut St.
1904. Craig, Frank A., The Henry Phipps Institute, 7th and Lombard Sts.
1907. Crampton, George S., 2031 Locust St.
1947. Crane, A. Reynolds, 807 Spruce St.
1937. Crane, Martin P., 2412 N. Broad St.
1920. Creighton, William J., 37 S. 20th St.
1941. Creskoff, Adolph J., 3400 Spruce St.
1920. Cross, George H., Chester, Pa.
1917. Cross, Sumner H., P. O. Box 126, Jenkintown, Pa.
1921. Crossan, Edward T., 5324 Wayne Ave.
1940. Crowe, Aldrich C., 735 Atlantic Ave., Ocean City, N. J.
1904. Cruice, John M. 407 S. 22d St.
1937. Crump, Jean, 1930 Chestnut St.
1937. Curtis, Lawrence, 255 S. 17th St.
1934. Custer, R. Philip, 221 Walnut Ave., Wayne, Pa.

1941. *Cuttle, Tracy D., 261 Begier Ave., San Leandro, Calif.
1938. Dannenberg, Arthur M., 235 S. 15th St.
1947. Davis, C. Nelson, 133 South 36th St.
1936. Davis, David M., 255 S. 17th St.
1937. Davis, Perk Lee, 255 S. 17th St.
1935. Deaver, J. Montgomery, 1830 Delancey Pl.
1947. Deihne, Theodore L., Adams Avenue and Roosevelt Blvd.
1902. Deihoney, Howard, 240 S. 13th St.
1935. Deibert, Irvin Elmer, 538 Cooper St., Camden, N. J.
1948. Deichler, John W., 1930 Chestnut St.
1923. De Long, Perce, 37 S. 20th St.
1928. Dewees, A. Lovett, Glen Mills, Del. Co., Pa.
1924. Dillon, Edward S., 2802 Delancey Pl.
1932. Dintenfass, Henry, 1305 Spruce St.
1920. Doane, Joseph C., 617 W. Hortter St.
1948. Dohan, Francis Curtis, 80 Princeton Road, Cynwyd, Pa.
1946. Donnelly, Andrew J., 33rd and Powelton Ave.
1942. Donnelly, Edward J., 1321 Spruce St.
1933. Donnelly, Joseph C., 255 S. 17th St.
1937. Donnelly, Robert T. M., 255 S. 17th St.
1910. Drayton, William, Jr., 1930 Spruce St.
1949. Dripps, Robert D., 3400 Spruce St.
1935. Duane, William, Jr., 2100 Walnut St.
1944. Dublin, George J., 1930 Chestnut St.
1944. Dugger, John H., 3902 Vaux St.
1935. Duncan, Garfield G., 330 S. 9th St.
1937. Dunn, Charles W., 265 S. 19th St.
1942. Durant, Thomas M., 3401 N. Broad St.
1947. Durkin, John Keenan, 34 W. Montgomery Ave., Ardmore, Pa.
1942. Dyer, W. Wallace, Univ. of Pa. Hospital.
1935. Eads, John T., 2029 Delancey St.
1911. Earnshaw, Henry C., Bryn Mawr, Pa.
1936. Easby, Mary Hoskins, Woman's Hospital.
1948. Eaton, Francis H., 4007 Chestnut St.
1937. Edeiken, Joseph, 2130 Delancey Pl.
1944. Eger, Sherman A., 2029 Delancey St.
1949. Egoville, John W., 720 W. 63rd St.
1944. Ehrich, William E., 540 W. Hortter St.
1930. Eiman, John, Cynwyd, Pa.
1948. Einhorn, Nathan H., 6374 Drexel Road.
1946. Elfman, Louis Kenneth, 6330 Lebanon Avenue.
1949. Elkinton, J. Russell, Oak Lane, Moylan, Pa.
1939. Ellis, Van Mashburn, 1530 Locust St.
1928. Ellison, Richard T., 269 S. 19th St.
1936. Ellson, J. Vernon, Glendale Rd. & Chestnut St., Upper Darby, Pa.
1904. Elmer, Walter G., 1801 Pine St.
1937. Elsom, Kendall A., 133 S. 36th St.
1934. Ely, William C., 3912 Chestnut St.
1932. Engel, Gilson C., 255 S. 17th St.
1945. English, O. Spurgeon, 3401 N. Broad St.
1942. Erb, William H., 133 S. 36th St.

* On active service.

1950. Ersner, Matthew S., 1915 Spruce St.
1944. Estes, William L., Jr., Bethlehem, Pa.
1948. Everts, Glenn S., 5515 Wissahickon Ave., Apt. D-403.
1946. Farell, David M., 1912 Spruce St.
1922. Farley, David L., 4429 Larchwood Ave.
1903. Farr, Clifford B., Bryn Mawr, Pa.
1945. Farrar, George Elbert, Jr., 528 Scott Rd., Gladwyne, Pa.
1930. Farrell, John T., Jr., 255 S. 17th St.
1935. Ferguson, Lewis Kraeer, 133 S. 36th St.
1936. Fetter, Ferdinand, 322 S. 21st St.
1945. Fetter, John S., High Rd. at Welsh Rd., Huntingdon Valley, Pa.
1935. Fetter, Theodore R., 255 S. 17th St.
1924. Fewell, Alexander G., 1924 Pine St.
1943. Finkelstein, Arthur, 480 Latch's Lane, Merion, Pa.
1947. First, Arthur, 1714 Spruce St.
1945. Fiske, Frederick A., 1530 Locust St.
1928. Fitz-Hugh, Thomas, Jr., 2016 Delancey Pl.
1928. Flick, John B., 330 S. 9th St.
1939. Flippin, Harrison F., 255 S. 17th St.
1946. Forster, Francis M., Jefferson Medical College.
1941. Fox, C. Calvin, 1806 Spruce St.
1906. Fraley, Frederick, 71st and City Line, Overbrook, Pa.
1941. Frazier, William Doane, 133 S. 36th St.
1942. Friedman, Reuben, 877 N. 6th St.
1933. Fritch, James Scott, 269 S. 19th St.
1937. Fritz, Herbert H., Pennswood Rd., Bryn Mawr, Pa.
1940. Fry, Kenneth E., 255 S. 17th St.
1935. Fry, Wilfred Eyles, 1930 Chestnut St.
1937. Furlong, Thomas F., Jr., Times Medical Building, Ardmore, Pa.
1935. Gammon, Geo. D., Univ. of Pa. Hospital.
1931. Garner, Vaughn C., Germantown Professional Building.
1950. Garvin, Eugene J., 4219 Baltimore Ave.
1935. Geist, Donald C., 1930 Chestnut St.
1899. Gibbon, John H., Media, Pa.
1934. Gibbon, John H., Jr., 1025 Walnut St.
1939. Gibson, Glen Gregory, 2031 Locust St.
1944. Gifford, Edward S., Jr., 1913 Spruce St.
1920. Gill, A. Bruce, 1930 Chestnut St.
1927. Gilmour, William R., 413–14 Weightman Bldg., 1524 Chestnut St.
1949. Ginsburg, Isadore W., 3401 N. Broad St.
1931. Giordano, Anthony A. S., 1819 S. Broad St.
1945. Goldberg, Samuel J., 1723 Pine St.
1933. Goldburgh, Harold L., 1932 Spruce St.
1935. Goldsmith, N. Ralph, 1351 Tabor Rd.
1949. Gopadze, Illarion I., 1809 Delancey Pl.
1905. Gordon, Alfred, 1520 Spruce St.
1928. Gordon, Burgess L., 1832 Spruce St.
1937. Gordon, William, 5345 Spruce St.
1941. Gouterman, Joseph I., 1930 Chestnut St.
1947. Grady, Hugh G., Gaithersburg, Md.
1894. Graham, Edwin E., 1713 Spruce St.
1926. Grant, Francis Clark, Univ. of Pa. Hospital.
1940. Greene, Lloyd B., 136 S. 16th St.

1950. Gregory, John E., 235 N. 15th St.
1934. Griffith, John Q., Jr., 6 N. Fredericksburg Ave., Margate, N. J.
1945. Griffiths, John E., Mermont Apartments, Bryn Mawr, Pa.
1941. Groff, Robert A., 700 Univ. of Pa. Hospital.
1933. Gruber, Charles M., 128 Overhill Rd., Cynwyd, Pa.
1932. Guequierre, Jacques P., Mermont Plaza, Bryn Mawr, Pa.
1945. György, Paul, Univ. of Pa.
1935. Hadden, Samuel B., 37 S. 20th St.
1945. Hahn, George A., 255 S. 17th St.
1935. Haines, Harlan F., 134 S. State Rd., Upper Darby, Pa.
1939. Hamblock, Leonard C., 1632 Spruce St.
1938. Hand, John G., 1724 Pine St.
1947. Hanes, William James, 218 E. Beechtree Lane, Wayne, Pa.
1932. Harris, Stanley E., 229 Maple Ave., Delanco, N. J.
1948. Harris, T. N., 2222 N. 53rd St.
1929. Harrison, Francis G., 1900 Spruce St.
1933. Harrison, William John, 135 S. 17th St.
1903. Hart, Charles D., 420 W. Mermaid Lane.
1941. Hartley, Harriet L., 1719 Rittenhouse Square.
1926. Hartmann, Fred L., 1914 Pine St.
1946. Harvey, Edith E., 406 York Rd., Jenkintown, Pa.
1947. Harvey, Rolfe Marsh, Glenmary & Houston Rds., Radnor, Pa.
1935. Haskell, Benjamin F., 1426 Spruce St.
1946. Hatfield, C. Alexander, 330 S. 9th St.
1907. Hatfield, Charles James, Henry Phipps Institute, 7th and Lombard Sts.
1947. Havens, Walter Paul, Jr., 300 Cherry Lane, Wynnewood, Pa.
1947. Hawthorne, Herbert Reid, 606 North 13th St.
1911. Heed, Charles R., 1205 Spruce St.
1946. Hendrickson, Frank O., 37 S. 20th St.
1944. Herbut, Peter A., Jefferson Medical College Hospital.
1927. Herman, Leon, 136 S. 16th St.
1944. Hershey, J. Ivan, 935 Bowman Ave., Wynnewood, Pa.
1924. Hewson, William, 1614 Locust St.
1949. Heyl, W. Meredith, 100 W. Coulter St.
1924. Hirst, John C., 2d, 500 N. 20th St.
1944. Hirst, Otto C., 3601 Stokley St.
1943. Hitschler, William J., 8840 Germantown Ave.
1944. Hneleski, Ignatius S., 802 S. 48th St.
1943. Hockaday, Agnes, 316 Shadeland Ave., Drexel Hill, Pa.
1939. Hodes, Philip J., Univ. of Pa. Hospital.
1947. Hodges, John H., 1025 Walnut St.
1948. Hoffman, George L., Jr., 133 S. 36th St.
1949. Hollander, Joseph L., 36th & Spruce Sts.
1932. Hollingsworth, I. Pemberton, 411 N. Walnut St., West Chester, Pa.
1919. Hopkins, Arthur H., 1726 Pine St.
1949. Hopkins, Henry U., 4526 Osage Ave.
1946. Horan, Gerald W., 5819 Chester Ave.
1950. Horn, Robert C., 57 Berkley Ave., Lansdowne, Pa.
1947. Horwitz, Orville, 133 S. 36th St.
1950. Houlihan, Carl T., 728 S. 60th St.
1944. Housel, Edmund L., 255 S. 17th St.
1928. Houser, Karl Musser, 2035 Delancey Pl.
1938. Howell, John Carnett, 326 S. 19th St.

1948. Howland, Alvin Wilcox, 255 S. 17th St.
1946. Howson, John Yeatts, 316 Lancaster Ave., Wayne, Pa.
1947. Huber, John Franklin, Temple University Hospital.
1937. Hughes, Joseph, 111 N. 49th St.
1939. Hughes, P. Boland, 419 Hillbrook Rd., Bryn Mawr, Pa.
1923. Hume, John E., 37 S. 20th St.
1946. Hunt, William T., Jr., 1930 Chestnut St.
1921. Hunter, Robert John, 2035 Delancey Pl.
1926. Husik, David N., 331 S. 46th St.
1950. Imbriglia, Joseph E., 329 Shadeland Ave., Drexel Hill, Pa.
1935. Ingleby, Helen, Jewish Hospital, York & Tabor Rds.
1949. Ingraham, Norman R., Jr., Stenton and Whitemarsh Ave.
1947. Israel, S. Leon, 2116 Spruce St.
1921. Ivy, Robert H., 1930 Chestnut St.
1917. Jackson, Chevalier, 3401 N. Broad St.
1932. Jackson, Chevalier L., 255 S. 17th St.
1934. Jacobs, Maurice, 1831 Delancey Place.
1947. Jaeger, Rudolph, Jefferson Hospital.
1941. Jeffers, William A., University of Pa. Hospital.
1928. John, Rutherford L., 256 S. 21 St.
1942. Johnson, Juilan, 406 Conshohocken State Rd., Narberth, Pa.
1938. Johnson, Thomas A., 250 S. 18th St.
1918. Jonas, Leon, 255 S. 17th St.
1924. Jones, Harold W., 1930 Chestnut St.
1936. Kain, Thomas M., 403 Cooper St., Camden, N. J.
1948. Kaplan, Louis, 2040 Pine St.
1938. Kasper, Kelvin A., 135 S. 18th St.
1945. Katz, G. Henry, 111 N. 49th St.
1941. Kauffman, M. Luther, Medical Arts Bldg., Jenkintown, Pa.
1947. Kay, Calvin Frederick, Univ. of Pa. Hospital.
1947. Keefer, George Pfahler, 3708 Woodland Ave., Drexel Hill, Pa.
1938. Keeler, Harold R., 136 S. 16th St.
1949. Keiserman, Joseph, 5460 Baltimore Ave.
1935. Kelley, George F. J., N.E. Cor. 20th and Chestnut Sts.
1932. Kelly, Herbert T., 1900 Spruce St.
1912. Kelly, Thomas C., 105 School Lane.
1941. Kennedy, Patrick J., 6910 Market St., Upper Darby Pa.,
1947. Kennedy, William Blair, 3400 Spruce St.
1948. Kern, Franklin Moore, 537 S. 46th St.
1921. Kern, Richard A., Temple University Hospital.
1935. Keyes, Baldwin L., 2031 Locust St.
1930. Kimbrough, Robert A., Jr., 807 Spruce St.
1936. King, Orville C., 330 S. 9th St.
1920. Klauder, Joseph V., 1934 Spruce St.
1920. Klein, Thomas, 250 S. 18th St.
1934. Kline, Oram R., 514 Cooper St., Camden, N. J.
1948. Klingensmith, Paul O., 133 S. 36th St.
1932. Klopp, John W., 731 E. Phil-Ellena St.
1919. Knipe, Norman, L. 1930 Chestnut St.
1908. Knowles, Frank C., 423 Warick Rd., Wynnewood, Pa.
1945. Kobler, H. B., 658 N. 63rd St.
1948. Koerber, Kenneth A., 6101 Wayne Ave.
1914. Kolmer, John A., Cynwyd, Pa.

1936. Konzelmann, Frank Williamson, 304 Shore Rd., Absecon, N. J.
1949. Koop, C. Everett, 1740 Bainbridge St.
1941. Krall, J. Thomas, 1927 Spruce St.
1948. Kramer, David W., 2007 Pine St.
1944. Krauss, Frederick Harold, 1930 Chestnut St.
1949. Kremer, David N., 1918 Pine St.
1949. Kressler, Robert J., 330 S. 9th St.
1941. Krewson, William E., 3rd, 1930 Chestnut St.
1914. Krumbhaar, Edward B., School of Medicine, Univ. of Pa.
1947. Kuhlenbeck, Hartwig, Woman's Medical College.
1947. La Boccetta, Alfred Charles, 2nd and Luzerne Sts.
1949. La Clair, Charles H., Jr., 1021 W. Main St., Norristown, Pa.
1950. Lamont, Austin, 3400 Spruce St.
1946. Lampe, William T., 4207 Tyson Ave.
1933. Langdon, Roy L., 5917 Greene St.
1941. Langner, Paul H., Jr., 130 S. 18th St.
1945. Lansbury, John, 3401 N. Broad St.
1934. Laplace, Louis B., 1930 Chestnut St.
1926. Laws, George M., 1907 Spruce St.
1936. Leaman, William G., Jr., 3700 Baring St.
1950. Learner, Norman, 255 S. 17th St.
1920. Leavitt, Frederic Headley, 1527 Pine St.
1941. Leberman, Paul R., 136 S. 16th St.
1908. Lee, Walter Estell, 1833 Pine St.
1942. Leiman, James A., 255 S. 17th St.
1936. Lehrfeld, Louis, 1321 Spruce St.
1944. Lell, William A., 203 W. Chestnut Ave.
1935. Lemmon, William T., 1930 Chestnut St.
1943. Leopold, Irving H., 1930 Chestnut St.
1920. Leopold, Simon S., 255 S. 17th St.
1944. Lettiere, Anthony J., 425 E. State St., Trenton, N. J.
1933. Levering, J. Walter, Abington Memorial Hospital, Abington, Pa.
1915. Lewis, Fielding, O., Providence Road, Media, Pa.
1938. Lewis, James P., 3815 Chestnut St.
1949. Lhamon, William T., Monument Road, Bala-Cynwyd, Pa.
1948. Lieber, Marshall M., 1025 Walnut St.
1948. Lieberman, Louis M., 923 Belmont Ave.
1940. Limberger, William A., 301 S. Church St., West Chester, Pa.
1938. Lindauer, M. August, 133 S. 36th St.
1927. Lindsey, Walter H., 810 W. Dauphin St.
1936. Lintgen, Charles, 1930 Chestnut St.
1945. Lisker, Samuel, 1930 Chestnut St.
1944. Livezey, Mary M., 7200 Cresheim Rd.
1936. Llewellyn, Thomas H., 910 N. 63rd St.
1907. Lodholz, Edward, 431 S. 45th St.
1931. Loewenberg, Samuel A., 1905 Spruce St.
1938. Long, Charles-Francis, 1128 70th Ave.
1933. Long, Esmond R., Henry Phipps Institute, 7th and Lombard Sts.
1949. Long, Joan Humphrey, 17B Parkway Apartments, Haddonfield, N. J.
1935. Long, William L., 2025 Walnut St.
1931. Longaker, Edwin P., 41 E. Montgomery Ave., Ardmore, Pa.
1942. Lownes, John B., 136 S. 16th St.
1936. Lucchesi, Pascal Francis, Philadelphia General Hospital.

1921. Lucké, Balduin H. E., School of Medicine, Univ. of Pa.
1932. Lukens, Francis D. W., Univ. of Pa. Hospital.
1930. Lukens, Robert M., 1308 W. Hunting Park Ave.
1929. Lull, Clifford B., Women's Bldg., Penna. Hosp., 807 Spruce St.
1939. Luongo, Romeo A., 2054 Locust St.
1947. Lurie, Max B., Henry Phipps Institute, 7th and Lombard St.
1919. Lynch, Frank B., Jr., Germantown Hosp., Penn and Chew Sts.
1950. Lynch, J. Edward, 255 S. 17th St.
1914. Lyon, B. B. Vincent, Box 955, Winter Park, Fla.
1933. McAndrews, Leo F., Bryn Mawr Medical Bldg., Bryn Mawr, Pa.
1932. McCahey, James F., 1534 Pine St.
1948. McCall, Milton L., 1814 Spruce St.
1900. McCarthy, Daniel J., 2025 Walnut St.
1936. McCarthy, Patrick A., Central Medical Bldg.
1935. McClenahan, William U., 1 Summit Ave.
1931. McCloskey, Edward, 7 E. Chestnut Ave.
1942. McCloskey, John F., 8720 Germantown Ave.
1935. McConnell, James W., 20th and Chestnut Sts.
1934. McCouch, Grayson P., Medical School, Univ. of Pa.
1938. McCrea, Lowrain E., 1930 Chestnut St.
1937. McCutcheon, Morton, Alden Park Manor.
1942. McDonald, P. Robb, 1930 Chestnut St.
1950. McFadden, William M., 1187 E. Washington Lane.
1949. McGavic, John S., 601 Montgomery Ave., Bryn Mawr, Pa.
1945. McGee, Lemuel Clyde, Hercules Powder Company, Wilmington, Del.
1937. McGuinness, Aims C., Children's Hospital, 1740 Bainbridge St.
1940. McLaughlin, Edward F., 4116 N. Broad St.
1933. McLaughlin, James S., 330 S. 9th St.
1924. McMillan, Thomas M., 2044 Locust St.
1924. McPhedran, F. Maurice, Germantown Hosp., Penn and Chew Sts.
1943. Macfarlan, Douglas, 1805 Chestnut St.
1932. Macfarlane, Catharine, 136 S. 16th St.
1947. Machella, Thomas E., 232 S. 39th St.
1950. Mackmull, Gulden, Germantown Professional Building.
1949. MacNeal, Perry Scott, 330 S. 9th St.
1939. Macneill, Norman N., 5807 Chew St.
1935. Maeder, LeRoy M. A., 1910 Rittenhouse Sq.
1942. Manges, Lewis C., Jr., 319 S. 16th St.
1936. Mann, Bernard, 2019 Pine St.
1948. Marden, Philip Ayer, 1912 Spruce St.
1937. Margolies, Alexander, 255 S. 17th St.
1950. Mark, George E., 3401 N. Broad St.
1950. Marshall, E. Wayne, Jr., 1520 Spruce St.
1941. Martin, James R., 136 S. 16th St.
1939. May, Hans, 255 S. 17th St.
1934. Mecray, Paul M., 405 Cooper St., Camden, N. J.
1941. Mendell, Theodore H., 2023 Spruce St.
1949. Menkin, Valy, 3401 N. Broad St.
1943. Meranze, David R., 1031 Lakeside Ave.
1937. Meyer, George Phililp, 410 Haddon Ave., Camden, N. J.
1935. Miller, Ford A., 4016 Chestnut St.
1946. Miller, Franklin R., Jefferson Medical College.
1939. Miller, Malcolm W., 255 S. 17th St.

1939. Miller, Merle M., 6013 Greene St.
1932. Miller, M. Valentine, 114 W. Phil-Ellena St.
1921. Miller, T. Grier, 133 So. 36th St.
1937. Missett, Joseph Vincent, Jr., 2031 Locust St.
1904. Mitchell, Charles Franklin, 2003 Pine St.
1950. Mitchell, John McK., Medical School, Univ. of Pa.
1948. Mogavero, Francesco, 1930 Chestnut St.
1932. Mohler, Roy W., 1806 Spruce St.
1936. Montgomery, Hugh, 119 Glenn Road, Ardmore, Pa.
1936. Montgomery, John B., 1930 Chestnut St.
1932. Montgomery, Thaddeus L., 2031 Locust St.
1935. Moore, John Royal, Beury Bldg., Broad St. and Erie Ave.
1947. Moore, Matthew Thibaud, 1813 Delancey Pl.
1924. Moorhead, Stirling W., 1523 Pine St.
1936. Morgan, David R., Jefferson Medical College.
1893. Morris, Elliston J., 439 Midland Ave., St. Davids, Del. Co., Pa.
1944. Morris, Harold H., Villa Nova, Pa.
1945. Morris, I. Paul, 255 S. 17th St.
1949. Motley, Hurley L., 901 Remington Road, Wynnewood, Pa.
1941. Mucklé, Craig, Wright, 255 S. 17th St.
1929. Mudd, Stuart, Department of Bacteriology, Medical School, Univ. of Pa.
1949. Mulholland, Stanford W., 255 S. 17th St.
1935. Mullen, Carroll Richard, 2025 Locust St.
1934. Mullen, Edward A., 472 Roxborough Ave.
1930. Murphy, Douglas P., Univ. of Pa. Hospital.
1934. Murphy, Eugene C., 1841 S. Broad St.
1945. Naide, Meyer, 2034 Spruce St.
1950. Nardone, Anthony A., 912 S. 49th St.
2950. Neefe, John R., 133 S. 36th St.
1948. Neese, Paul H., 17 Derwen Road, Cynwyd, Pa.
1936. Nelson, Guy M., 255 S. 17th St.
1943. Nelson, Waldo E., 615 Moreno Rd., Narberth, Pa.
1905. Newcomet, William S., 3501 Baring St.
1938. Newton, Zachariah B., 601 E. Sedgwick St.
1935. Nicholson, Jesse Thompson, Pennsylvania Hospital.
1899. Nicholson, William Rufus, 1930 Chestnut St.
1941. Nisbet, Verner, 254 S. 45th St.
1950. Nixon, Norman, 111 N. 49th St.
1947. Noone, Ernest L., 4501 Cedar Lane, Drexel Hill, Pa.
1905. Norris, Charles C., Darby and Goshen Roads, Bryn Mawr, Pa.
1938. Norris, Robert F., 513 Wynnewood Ave., Wynnewood, Pa.
1947. O'Keefe, John J., 255 South 17th St.
1913. O'Neal, Alexander Hay, St. Davids, Pa.
1949. O'Neill, James F., 8050 Holmes Ave.
1947. Ornsteen, A. M., 2007 Delancey Pl.
1947. Ornston, Darisu Gray, 36 Carpenter Lane.
1936. Orr, Theodore E., 1930 Chestnut St.
1913. Outerbridge, George W., 1927 Spruce St.
1915. Owen, Hubley, R. 311 S. Juniper St.
1949. Padis, Nicholas, 255 S. 17th St.
1909. Parish, Benjamin Dores, 1927 Spruce St.
1945. Park, Felix Roman, Medical Arts Bldg., Tulsa, Okla.
1940. Parker, Alan P., Bryn Mawr Medical Bldg., Bryn Mawr, Pa.

1948. Parkhurst, Leonard Woods, 330 S. 9th St.
1944. Paschkis, Karl E., Jefferson Medical College.
1931. Paul, John Davis, 3112 N. Broad St.
1932. Payne, Franklin L., Univ. of Pa. Hospital.
1943. Pearson, Gerald H. J., 111 N. 49th St.
1930. Pendergrass, Eugene P., Univ. of Pa. Hospital.
1932. Pennell, Howard Y., West Chester, Pa.
1939. Pepper, D. Sergeant, 122 Grays Lane, Haverford, Pa.
1914. Pepper, O. H. Perry, Univ. of Pa. Hospital.
1916. Percival, Milton Fraser, 2332 S. Broad St.
1942. Perkins, William Harvey, 1025 Walnut St.
1946. Perloff, William Harry, 1930 Chestnut St.
1940. Pessel, Johannes, F., 224 West State St., Trenton, N. J.
1937. Pettit, Horace, Times Medical Bldg., Ardmore, Pa.
1949. Pettit, Mary DeWitt, 1930 Spruce St.
1905. Pfahler, George E., 1930 Chestnut St.
1915. Pfeiffer, Damon B., Meadowbrook, Pa.
1946. Pfeiffer, Mildred C. J., 331 S. Smedley St.
1935. Phillips, Arthur W., 3904 Walnut St.
1911. Piersol, George Morris, Univ. of Pa. Hospital.
1948. Pierson, Daniel B., Jr., 1830 Delancey St.
1933. Pillsbury, Donald M., Univ. of Pa. Hospital.
1950. Pincus, Irwin J., 269 S. 19th St.
1937. Polk, David Stewart, Rosemont, Pa.
1932. Porter, Roland De Lance, Jenkintown, Pa.
1949. Pratt, Gerald E., 3009 Frankford Ave.
1947. Prickett, John A., Warrington, Bucks County, Pa.
1931. Pryor, Charles Allen, 255 S. 17th St.
1947. Putney, Floyd Johnson, 255 South 17th St.
1943. Radbill, Samuel X., 7043 Elmwood Ave.
1945. Rakoff, Abraham Edward, 269 S. 19th St.
1931. Ramsey, Frank M., 620 E. Willow Grove Ave.
1913. Randall, Alexander, 136 S. 16 Street.
1941. Rankin, Charles A., Ludlow & Heather Rd., Upper Darby, Pa.
1946. Rapoport, Milton, Children's Hospital, 1740 Bainbridge St.
1926. Ravdin, I. S., Univ. of Pa. Hospital.
1928. Reese, Warren S., 2118 Locust St.
1925. Reeves, Rufus S., 2227 Spruce St.
1920. Rehfuss, Martin E., 131 St. George's Rd., Ardmore, Pa.
1921. Reiff, E. Paul, 1927 Spruce St.
1937. Reimann, Hobert A., Jefferson Hospital.
1919. Reimann, Stanley P., 703 W. Phil-Ellena St.
1945. Rhoads, Jonathan E., Univ. of Pa. Hospital.
1936. Richards, James L., Bryn Mawr Medical Bldg., Bryn Mawr, Pa.
1919. Richardson, Russell, 320 S. 16th St.
1942. Riggs, Helena E., Philadelphia General Hospital.
1936. Ritter, Joseph A., 2405 N. 54th St.
1932. Robbins, Frederick R., 317 Millbank Rd., Bryn Mawr, Pa.
1939. Roberts, Ella, 133 S. 36th St.
1899. Roberts, Walter, 1921 Spruce St.
1932. Robertson, Harold F., 327 S. 17th St.
1903. Robertson, William Egbert, 327 S. 17th St.
1938. Roche, Philip Q., 255 S. 17th St.

1912. Rodman, John Stewart, 1726 Spruce St.
1947. Rogers, Arthur Merriam, 133 S. 36th St.
1934. Rogers, Harry L., 1537 Pine St.
1948. Roscoe, Constantine R., 7226 Castor Ave.
1928. Rose, Edward, 426 Owen Rd., Wynnewood, Pa.
1936. Rose, Elizabeth Kirk, 426 Owen Rd., Wynnewood, Pa.
1946. Rosemond, George Parrott, Temple University, Broad & Ontario Sts.
1948. Rothman, Maurice M., 1727 Spruce St.
1932. Rothrock, Harry A., West Chester, Pa.
1936. Rothschild, Norman, 245 S. 16th St.
1937. Roxby, John B., P. O. Box #28, Swarthmore, Pa.
1949. Royster, Henry P., 3400 Spruce St.
1941. Royster, Hubert A., Jr., The Mermont, Bryn Mawr, Pa.
1933. Rudolphy, Jay Besson, 230 S. 21st St.
1946. Rupp, Charles, 133 S. 36th St.
1947. Rush, Alexander, 330 South 9th St.
1945. Rynes, Samuel E., 334 S. 21st St.
1944. Sampson, David Alan, 726 Braeburn Lane, Penn Valley, Narberth, Pa.
1936. Sands, Joseph Evans, Rosemont, Pa.
1950. Sarner, Joseph B., 1803 Pine St.
1949. Saul, Leon J., 255 S. 17th St.
1908. Sautter, Albert C., Germantown Professional Bldg.
1947. Sayen, John J., 506 Montgomery Ave., Haverford, Pa.
1948. Scarano, Joseph Albert, 1432 S. Broad St.
1920. Scarlett, Hunter W., 825 Montgomery Ave., Bryn Mawr, Pa.
1917. Schaeffer, J. Parsons, Daniel Baugh Institute, 307 S. 11th St.
1929. Scheffey, Lewis C., 255 S. 17th St.
1942. Scheie, Harold G., 313 S. 17th St.
1929. Schenck, Harry P., 1235 Wyngate Rd., Wynnewood, Pa.
1945. Schlezinger, Nathan S., 255 S. 17th St.
1917. Schnabel, Truman G., 1704 Pine St.
1917. Schoff, Charles H., Media, Pa.
1928. Schofield, Frederick S., 5501 Greene St.
1921. Schumann, Edward A., 1814 Spruce St.
1950. Schumann, Francis N., 8811 Germantown Ave.
1948. Schwarz, Gabriel A., 255 S. 17th St.
1930. Scott, John Porter, Children's Hospital, 1740 Bainbridge St.
1950. Scott, Michael, 255 S. 17th St.
1940. Scott, T. F. McNair, Children's Hospital, 1740 Bainbridge St.
1924. Shallow, Thomas A., 1611 Spruce St.
1908. Shannon, Charles E. G., 9 Park St., Waterville, Me.
1950. Sharp, Reuben L., 719 Cooper St., Camden, N. J.
1928. Sharpless, Frederick C., Rosemont, Pa.
1948. Shay, Harry, 255 S. 17th St.
1931. Sheehan, William C., 8811 Germantown Ave.
1946. Shepherd, Samuel Garfield, 2039 Pine St.
1932. Sheridan, Joyce T., 412 W. Durham St.
1936. Shipman, James Shelby, 255 S. 17th St.
1935. Shoemaker, Robert, 3rd, 68 Byberry Rd., Hatboro, Pa.
1946. Shoup, George Daniel, 7007 N. 12th St.
1936. Shuster, Benjamin H., 1824 Pine St.
1949. Sidlick, David M., 255 S. 17th St.
1941. Silcox, Louis E., 255 S. 17th St.

1907. Sinkler, Francis W., P. O. Box 373, Bryn Mawr, Pa.
1933. Smelzer, Donald Campbell, 311 S. Juniper St.
1929. Smith, Austin T., 1830 Spruce St.
1947. Smith, Frederick C., 409 S. 22nd St.
1933. Smith, Lauren Howe, 111 N. 49th St.
1927. Smyth, Calvin Mason, Abington Memorial Hospital, Abington, Pa.
1938. Snodgrass, L. E., 2011 Chestnut St.
1935. Sokoloff, Martin J., 255 S. 17th St.
1940. Soloff, Louis A., 255 S. 17th St.
1935. Sommer, George N. J., 120 W. State St., Trenton, N. J.
1944. Sommer, George N. J., Jr., 120 W. State St., Trenton, N. J.
1950. Somerville, William J., 2022 Locust St.
1928. Spaeth, Edmund B., 1930 Chestnut St.
1937. Spangler, John Luther, Devon, Pa.
1935. Spiegel, Ernest, 6807 Lawnton Ave., Oak Lane.
1929. Sponsler, Marshall B., 1737 Chestnut St.
1944. Stadie, William C., University Hospital.
1927. Starr, Isaac, 505 Cresheim Valley Rd.
1945. Stecher, H. Armin, 1510 Darby Rd., Havertown, Pa.
1946. Stein, Irvin, 1936 Spruce St.
1947. Steiner, Charles A., Upper Darby, National Bank Building, Upper Darby, Pa.
1936. Steinfield, Edward, N. E. Cor. 18th and Chestnut Sts.
1942. Stengel, Alfred, Jr., Lancaster Ave. and Cambria Court, St. Davids, Pa.
1948. Stevens, Lloyd W., 133 S. 36th St.
1941. Stewart, Winifred B., 1930 Spruce St.
1949. Stockwell, Eunice L., 2018 Pine St.
1925. Stokes, John H., 4228 Spruce St.
1928. Stokes, Joseph, Jr., Children's Hospital, 1740 Bainbridge St.
1943. Stokes, S. Emlen, 129 Chester Ave., Moorestown, N. J.
1923. Strecker, Edward A., 111 N. 49th St.
1923. Stroud, William Daniel, 1011 Clinton St.
1937. Strumia, Max M., Penn Valley, Narberth, Pa.
1933. Stuckert, Harry, 248 S. 21st St.
1937. Sturgis, Margaret C., 349 Wistar Rd., Wynnewood, Pa.
1927. Sturgis, Samuel Booth, 349 Wistar Rd., Wynnewood, Pa.
1934. Summey, Thomas J., 330 S. 9th St.
1936. Surver, James Miller, 1020 Clinton St.
1928. Swartley, William B., 6002 Greene St.
1934. Sweeney, John A., 1900 Rittenhouse Sq.
1944. Swenson, Paul C., Jefferson Hospital.
1948. Tait, Edwin Forbes, 1324 Main St., Norristown, Pa.
1943. Tassman, Isaac S., 136 S. 16th St.
1948. Tatnall, Charles R., Times Medical Building, Ardmore, Pa.
1946. Tauber, Robert, 2019 Walnut St.
1933. Taylor, Herbert W., Haverford, Pa.
1931. Taylor, Norman H., 100 W. Evergreen Ave.
1946. Thomas, Carmen C., 1930 Chestnut St.
1928. Thomas, J. Earl, Drexel Hill, Pa.
1927. Thorington, J. Monroe, 2031 Chestnut St.
1936. Thornton, Mary Bickings-, 2703 West Somerset St.
1936. Thorp, Francis Quicksall, 4900 Penn St.
1936. Thudium, William J., 136 S. 16th St.
1935. Tocantins, Leandro Maués, 424 W. Hortter St.

1945. Toland, Joseph J., Jr., 1241 W. Lehigh Ave.
1935. Toland, Owen J., Episcopal Hospital, Front and Lehigh Ave.
1949. Tornay, Anthony S., 37 S. 20th St.
1945. Tourish, William J., 1115 Childs Ave., Drexel Hill, Pa.
1949. Town, Arno E., 255 S. 17th St.
1936. Towson, Charles Emory, Germantown Professional Bldg.
1908. Tracy, Stephen E., Old Arch Rd., Norristown, Pa.
1947. Trueman, Robert H., 1930 Chestnut St.
1926. Tucker, Gabriel, 250 S. 18th St.
1938. Tuft, Louis, 1530 Locust St.
1933. Tumen, Henry J., 1900 Rittenhouse Sq.
1938. Turman, Christopher M., Wyncote, Pa.
1923. Turner, Creighton H., 1731 Pine St.
1945. Twyeffort, Louis H., 111 N. 49th St.
1929. Tyson, Ralph M., 255 S. 17th St.
1937. Uhle, Charles A. W., 255 S. 17th St.
1950. Ullery, John C., 255 S. 17th St.
1907. Ullom, Josephus T., Carpenter and Quincy Sts.
1950. Valdes-Dapena, Antonio, 101 Washington Ave., Havertown, Pa.
1937. Vander Veer, Joseph B., 330 S. 9th St.
1937. Van Loon, Emily Lois, 1930 Chestnut St.
1933. Vastine, Jacob H., 2nd, 136 S. 16th St.
1947. Vastine, Mary F., Woman's Medical College of Pa.
1940. Voegelin, Adrian W., Germantown Professional Bldg.
1941. Vogel, Stoughton R., 246 Walnut Lane.
1903. Wadsworth, William S., 3914 Baltimore Ave.
1927. Wagers, Arthur J., 1429 Spruce St.
1949. Wagner, Frederick B., Jr., 251 S. 41st St.
1949. Wagner, Joseph A., 2720 Darby Rd., Havertown, Pa.
1928. Wagoner, George W., Haverford Gables, Haverford, Pa.
1938. Waldman, Joseph, 404 Meadowbrook Lane.
1906. Walker, John K., 139 Little Lane, Haverford, Pa.
1907. Walker, Warren, 511 Lynmere Rd., Bryn Mawr, Pa.
1932. Walkling, Adolph A., 136 S. 16th St.
1932. Watt, Charles C., Jr., 100 W. Coulter St.
1933. Waygood, James Jamison, 3464 School Lane.
1941. Weaver, Ruth H., 2601 Parkway.
1930. Weeder, S. Dana, 250 W. Tulpehocken St.
1920. Weidman, Fred D., 20 Tenby Rd., Havertown, Pa.
1933. Weiss, Benjamin P., The Lenox, 13th and Spruce Sts.
1923. Weiss, Edward, 269 S. 19th St.
1950. Weiss, Sidney, 1930 Chestnut St.
1935. Whelan, G. L., 2100 Walnut St.
1921. Whitaker, William, 6771 Germantown Ave.
1936. White, Ellen Pawling Corson-, 1820 Pine St.
1925. Widmann, Bernard P., 250 S. 18th St.
1936. Wilder, Theodore S., 6013 Greene St.
1935. Willard, John Harrington, 334 S. 15th St.
1939. Willauer, George, 6129 Greene St.
1907. Williams, Carl, School Lane and Greene St.
1937. Williams, John C., 6370 Germantown Ave.
1920. Williams, Philip F., 2206 Locust St.
1950. Williams, R. G., Medical School, Univ. of Pa.

1927. Williamson, Ernest G., 6353 Woodbine Ave.
1949. Willson, J. Robert, 3401 N. Broad St.
1921. Wilson, George, 133 S. 36th St.
1945. Wilson, John F., 1930 Chestnut St.
1942. Wilson, Lucius R., 1305 Morris Road, Wynnewood, Pa.
1937. Wilson, Ross B., 1820 S. Rittenhouse Sq.
1902. Wilson, Samuel M., 1205 Spruce St.
1949. Wilson, William W., 133 S. 36th St.
1948. Winkelman, Nathaniel W., 1911 Spruce St.
1948. Winston, Julius, 5839 Chester Ave.
1941. Wirts, C. Wilmer, 2017 Delancey St.
1904. Wister, James W., 5430 Germantown Ave.
1933. Wohl, Michael G., 1727 Pine St.
1944. Wolf, Lewis R., 3474 Frankford Ave.
1918. Wolferth, Charles C., S.E. Cor. 36th & Spruce Sts.
1942. Wolman, Irving J., Lakeside Apts.
1893. Wood, Alfred C., 2035 Walnut St.
1950. Wood, Dorothy D., 2035 Walnut St.
1932. Wood, Francis C., 212 Laurel Lane, Haverford, Pa.
1900. Wood, George B., 329 Hathaway La., Wynnewood, Pa.
1903. Wood, Horatio C., Jr., 319 S. 41st St.
1944. Wood, H. Curtis, Jr., Skippack Pk., Whitemarsh, Pa.
1947. Wood, Oscar T., 2029 Delancey Pl.
1897. Woodward, George, W., Willow Grove Ave.
1928. Wright, Carroll S., 1402 Spruce St.
1937. Yaskin, Joseph C., 1832 Spruce St.
1943. Yawger, Nathaniel S., 103 S. 4th St., Darby, Pa.
1921. Ylvisaker, Lauritz S., 1203 Kenilworth, Alden Park.
1941. Young, Barton, Germantown Hospital.
1946. Zeigerman, Joseph H., 1836 Delancey St.
1894. Zentmayer, William, 1930 Chestnut St.
1947. Zintel, Harold A., Univ. of Pa. Hospital.
1949. Zintl, William J., 1930 Chestnut St.
1933. Zulick, J. Donald, Abington Memorial Hospital, Abington, Pa.

Non-Resident Fellows

ELECTED

1912. Addison, William H. F., 286 East Sidney Avenue, Mt. Vernon, N. Y.
1941. Aronson, Roland S., Medical Laboratory, Ft. McPherson, Ga.
1934. Bank, Joseph, 800 N. First Ave., Phoenix, Arixona.
1932. Behney, Charles A., 4030-C Urban St., Los Alamos, N. M.
1949. Bixby, Edward W., 61 W. Ross St., Wilkes-Barre, Pa.
1937. Braceland, Francis J., Mayo Clinic, 102–11 Second Ave., S.W., Rochester, Minn.
1919. Brown, Henry P., Jr., Hueitien Hospital, Kunming, Yunnan, China.
1948. *Brown, Robert B., Fleet P. O., San Francisco, Calif.
1908. Cadbury, William W., 274 W. Main St., Moorestown, N. J.
1936. Camero, Anthony R., 657 S. Westlake Ave., Los Angeles, Cal.
1930. Clarke, Francis Mann, 116 New St., New Brunswick, N. J.
1930. Cottrell, James E., Kennedy Veteran's Administration Hospital, Memphis, Tennessee.
1947. Cutler, Norman L., 1300 Harrison St., Wilmington, Del.
1941. Dixon, Harold M., 2125 5th Ave., San Diego, Calif.

1897. Dorland, W. A. Newman, Route 2, Box 775, Tampa, Fla.
1940. Forrester, James S., Harrisburg Polyclinic Hospital, Harrisburg, Pa.
1933. Fowler, Kenneth, 2535 Horton Ave., San Diego, Cal.
1947. Gaskill, Herbert S., 4528 College Ave., Indianapolis 5, Ind.
1913. Gates, Nathaniel, 10 Peterboro, Detroit, Mich.
1931. Gilman, Robert Louis, Cheyney, Pa.
1936. Guthrie, Donald, 118 S. Wilbur Ave., Sayre, Pa.
1902. Gwyn, Norman B., 109 Madison Ave., Toronto, Canada.
1936. Hatch, Lerleen Clement, 442 Molane Ave., Akron, Ohio.
1928. Hayman, Joseph Marchant, Jr., Lakeside Hosp., 2065 Adelbert Rd., Cleveland, Ohio.
1933. Hitzrot, Lewis H., Medical Director, Mercersburg Academy, Mercersburg, Pa.
1936. Hughes, Brady A., 312 Euclid Ave., Mt. Brook, Birmingham, Ala.
1899. Jopson, John H., Rutherfordton, N. C.
1947. Kelchner, Clyde H., 1125 Turner St., Allentown, Pa.
1931. Kinney, Willard H., 7300 Atlantic Ave., Ventnor, N. J.
1942. Kneedler, William H., 1821 Beverly Drive, Charlotte, N. C.
1944. LaMotte, William O., Medical Arts Building, Wilmington, Del.
1948. Livingood, Clarence S., School of Medicine, Univ. of Texas, Galveston, Texas.
1948. McLaughlin, John T., 1252 S. Central Ave., Glendale, Calif.
1900. McReynolds, Robert Phillips, 213 S. Broadway, Los Angeles, Cal.
1949. Manlove, Francis R., 535 N. Dearborn St., Chicago, Ill.
1935. Mason, James B., 4677 So. 34 St., Arlington, Va.
1935. Matthews, Robert A., 1542 Tulane Ave., New Orleans, La.
1932. Meade, Richard H., Jr., 750 San Jose Dr., Grand Rapids, Mich.
1936. Middleton, William Shainline, 2114 Adams St., Madison, Wisconsin.
1928. Moon, Virgil H., Bowman Gray School of Medicine, Winston-Salem, N. C.
1937. Nicholson, Samuel T., 2d., 642 High St., Pottstown, Pa.
1905. Norris, George W., Dimock, Pa.
1926. Paul, John Rodman, Dept. Internal Medicine, Yale University, New Haven, Conn.
1947. Pearce, Louise, Trevenna Farms, Belle Mead, N. J.
1922. Pleasants, Henry, West Chester, Pa.
1907. Price, George E., 1218 Terry Ave., Seattle, Wash.
1938. Read, Hilton S., 5407 Atlantic Ave., Atlantic City, N. J.
1936. Reisinger, John A., 901 20th St., N.W., Washington, D. C.
1907. Royer, B. Franklin, 429 E. Baltimore St., Greencastle, Pa.
1945. Schell, James F., Veterans Hospital, New Castle, Del.
1913. de Schweinitz, George L., 85 E. Broad St., Bethlehem, Pa.
1941. Shands, Alfred R., Jr., Alfred I. duPont Institute, Rockland Rd., Wilmington, Del.
1949. Shanno, Ralph L., 1174 Wyoming Ave., Forty Fort, Pa.
1943. Shewbrooks, Daniel N., The Acacia Mutual Life Ins. Co., Washington, D. C.
1950. Shiffer, Paul H., 111 N. 7th St., Stroudsburg, Pa.
1932. Siegel, Alvin Erdreich, Medical Arts Building, Macon, Ga.
1934. Stewart, Sloan G., Pacific and North Carolina Avenues, Atlantic City, N. J.
1931. Stiles, Merritt H., 1017 Paulson Medical & Dental Bldg., Spokane, Wash.
1930. Sunderman, F. William, 36 Butler St., Atlanta, Ga.
1942. Thompson, Wesley D., 18 N. Main St., Lewistown, Pa.
1941. Tompkins, Pendleton, 450 Sutter St., San Francisco, California.
1913. Vail, William Penn, Blairstown, N. J.
1912. Vaux, Norris W., Department of Health, Harrisburg, Pa.
1897. Veasey, Clarence Archibald, W. 1118–9th Ave., Spokane, Washington.
1931. Walker, Herschel Carey, 320 Park Ave., New York City, N. Y.
1914. Willard, De Forrest P., Sea Island, Ga.

Honorary Fellows

Limited to Fifty, of Whom Twenty May be Foreigners

American

Elected

1949. Alexander, John, Univ. of Michigan Hospital, Ann Arbor, Mich.
1947. Longcope, Warfield Theobald, Johns Hopkins Hospital, Baltimore, Md.
1917. Miner, Charles Howard, B.S., M.D., Member of Board of Directors, Wilkes-Barre General Hospital; Board of Health, Wilkes-Barre; Board of Directors, White Haven Sanitarium Association and Penna. Tuberculosis Society. 264 S. Franklin St., Wilkes-Barre, Pa.
1936. Richards, Alfred Newton, PH.D., SC.D., M.D. (HON.), LL.D., Professor of Pharmacology, School of Medicine, Vice-president in charge of Medical Affairs, Univ. of Pa. School of Medicine, Univ. of Pa., Phila.
1942. Russell, Frederick Fuller, M.D., Brig. Gen. Med. Corps, U. S. A. (Ret.). Rural Route 6, Box 39, Louisville, Kentucky.
1947. Stone, Robert Spencer, Univ. of California Medical School, San Francisco, Calif.

Foreign

1937. Dale, Sir Henry Hallett, C.B.E., F.R.S., M.A., M.D., F.R.C.P., Director, National Institute for Medical Research. The Wellcome Trust, 28 Portman Sq., London, W. C. England.
1922. McCarrison, Sir Robert, K.T., C.I.E., M.D., D.SC., LL.D., F.R.C.P., Major-General, Indian Medical Service (retired). 18 Linton Rd., Oxford, England.

Honorary Associates

1942. Conklin, Professor Edwin G., Princeton University, Princeton, N. J.
1942. Donner, William Henry, Lincoln-Liberty Bldg., Philadelphia, Pa.

Necrological List

Resident Fellows	*Date of Election*	*Date of Death*
John L. Atlee	January 7, 1935	April 3, 1950
Tilghman M. Balliet	February 2, 1898	September 28, 1950
Henry C. Bazett	November 1, 1922	July 12, 1950
Eldridge L. Eliason	November 1, 1911	March 6, 1950
Augustus A. Eshner	October 4, 1893	December 20, 1949
J. Claxton Gittings	January 3, 1906	March 8, 1950
R. Max Goepp	April 4, 1906	May 18, 1950
Arthur P. Hitchens	April 1, 1908	December 10, 1949
Thomas B. Lee	January 8, 1934	October 17, 1950
Frederic H. Lewey	January 7, 1948	October 6, 1950
Louis H. Mutschler	June 5, 1905	October 2, 1950
Francis R. Packard	November 3, 1897	April 18, 1950
Joseph E. Roberts	April 5, 1944	June 5, 1950
Horace J. Williams	June 4, 1924	June 3, 1950
Non-Resident Fellows		
Cyrus W. Fridy	October 2, 1935	May 13, 1950
John S. Lockwood	October 1, 1941	June 16, 1950
Honorary Fellow		
George R. Minot	January 8, 1947	February 25, 1950

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PUBLISHED AT BALTIMORE, MARYLAND

The College of Physicians of Philadelphia does not assume responsibility for statements or views expressed by contributors to the *Transactions & Studies*. The editor checks bibliographic references, to aid in making them factually reliable, and occasionally supplies headings in the text, to facilitate reference to clearly defined portions of the text; the communications are in other respects printed exactly as they were submitted, subject to author corrections on the galleys.

An index to the annual volume of the *Transactions & Studies* appears in the fourth and final number (February) of the volume.

The scientific and historical communications are indexed in: *Biological Abstracts*; *Current List of Medical Literature; Quarterly Cumulative Index Medicus.*

The Transactions & Studies of the College of Physicians of Philadelphia is published four times a year—April. June, December, February—at Baltimore, Maryland, by the College of Physicians of Philadelpbia. Subscription, $2 a volume. Single copies, 75 cents.
Publication Office: Mt. Royal and Guilford Aves., Baltimore 2, Md. *Editorial correspondence* sbould be addressed to: The Editor, College of Physicians of Philadelpbia, 19 South 22d Street, Philadelphia-3, Pa.
Entered as second class matter June 21, 1938, at the Post Office at Baltimore, Md., under the act of August 24, 1912.
Printed in U. S. A

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Founded 1787

1950

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PUBLISHED AT BALTIMORE, MARYLAND

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An index to the annual volume of the *Transactions & Studies* appears in the fourth and final number (February) of the volume.

The scientific and historical communications are indexed in: *Biological Abstracts*; *Current List of Medical Literature; Quarterly Cumulative Index Medicus.*

The Transactions & Studies of the College of Physicians of Philadelphia is published four times a year—April, June, December, February—at Baltimore, Maryland, hy the College of Physicians of Philadelphia
Subscription, $2 a volume. Single copies, 75 cents.
Publication Office: Mt. Royal and Guilford Aves., Baltimore 2, Md. *Editorial correspondence* should be addressed to: The Editor, College of Physicians of Philadelphia, 19 South 22d Street, Philadelphia-3, Pa.
Entered as second class matter June 21, 1938, at the Post Office at Baltimore, Md., under the act of August 24, 1912.
Printed in U. S. A.

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Preceding Number

Vol. 18, No. 3, December, 1950

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